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New
Series,
Vol. XXXIII

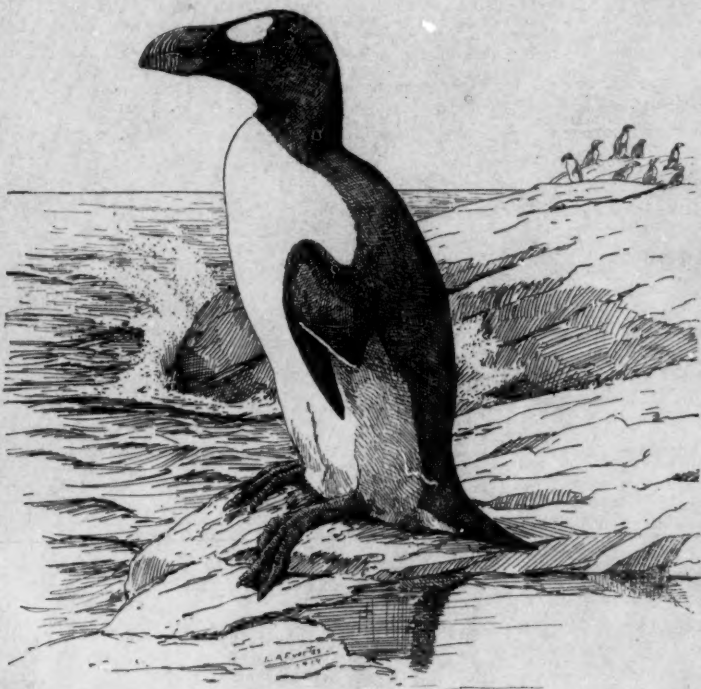
The Auk

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Vol. XXXIII

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BUFFLEHEAD.
FROM AN ORIGINAL WATERCOLOR BY JOHN JAMES AUDUBON.

THE AUK:

A QUARTERLY JOURNAL OF

ORNITHOLOGY.

VOL. XXXIII.

APRIL, 1916.

No. 2.

AUDUBONIANA.

BY JOHN E. THAYER.

Plates III-VI.

I HAD the good fortune recently to secure some very interesting Auduboniana, formerly the property of Dr. George Parkman of Boston. There are four original water-color paintings, representing the Butter-ball, Golden-eye and Merganser and the Golden-crowned Kinglet; also the original specimen of Parkman's Wren mounted on a twig, in a paper box with a glass front. The box is six and three quarters inches tall, four and a half inches wide and three inches deep, and the bird is in excellent condition. Two letters containing some references to the bird complete the collection.

The paintings are reproduced on the accompanying plates and the letters are printed in full below. The inscriptions on the paintings are as follows:

PLATE III.

Henderson March 19, 1815

No 71 44 The Spirit or Butterball — Bufflehead

PLATE IV.

Weight of female 1lb. 2/16

Length 16½ inches

Breadth $27\frac{1}{2}$ inches
 Tail feathers 16 inches
 French name
 Louisiana Gademe
 Golden Eye

PLATE V.

Longueur total 26 pouces
 Pesa (?) 3 lb. 13 onze
 Ano (?) gure 36 p^{ed} (?)
 J'Enleve avec beaucoup de Dificulté
 de l'eau ou il naga très profond.—
 Chute de L'Ohio 17 December 1809. J. A.
 No. 144
 64 Malaga Shell Drake. Goosander.
 Mergus Merganser A. W.

PLATE VI.

Golden Crested Wren A. W.
 Sylvia Regulus
 154 Shippingport, Kentucky
 Jan'y 28, 1820.
 drawn by J. J. Audubon
 Mistletoe on Black Walnut

This last is the most beautiful of all the original Audubon drawings that I have.

Parkman's Wren was one of the species discovered by J. K. Townsend on the Columbia River and Audubon describes it in Vol. V of the 'Ornithological Biography' p. 310, among "Species found in North America but not figured in the 'Birds of America.'" He states that Townsend secured but a single specimen and adds at the end of his account

"Feeling perfectly confident that this species is distinct from any other, and not finding it anywhere described, I have named it after my most kind, generous, and highly talented friend, George Parkman, Esq. M. D. of Boston, as an indication of the esteem in

which I hold him, and of the gratitude which I ever cherish towards him."

The first letter was evidently written when Audubon was engrossed in his work on the quadrupeds and while he and his sons were issuing the octavo edition of the "Birds of America." In this the Parkman's Wren was figured and as the part containing it appeared in 1841 it is probable that it was one of those which Dr. Parkman distributed in Boston for Audubon. After the plate was drawn it is evident that the type specimen was mounted as a gift for Parkman. The two letters follow.

New York, June 20th 1841

My Dear Friend.—

I intended having written to you yesterday by Miss Shattuck, who was good enough to spend the day with us, but I was so deeply engaged on a drawing of Rocky Mountain Flying Squirrels, that the time for her departure came suddenly and I could merely ask of her to say to you, that your last letter and remittance had reached us in safety, and with the unexampled promptness shewn by you on the three occasions you have been troubled with the delivery of 46 parts of our work to 46 of our Boston subscribers; and for which as I have said before I am very sorry to have nought but our sincerest thanks and gratitude to you for this, so remarkable friendly proceeding. May our God reward you and yours for all your generous actions.

I thank you also for your memorandums about the quadrupeds in the Boston Museum as I see that our animal there may save me the trouble of going to the State of Maine for it. When I was last under the hospitable roof of our Friend Doc^r Shattuck, I saw in George's room a N^o. of the "Penny Magazine" in which there is a plate representing a family of Beavers at work, that reminded me greatly of what I have seen in the ponds of Indiana some thirty years ago, and which I should like to have for a few days to assist in part in the making of the background to my Drawing of these animals, drawn from the Individual you procured for me. I will take good care of the N^o. and will return it safely very soon.

Should George Shattuck have forwarded that N^o. to M^r. B. of Baltimore, pray ask him to write to the later to send it me as soon

as convenient. If per chance you could procure for me a live *Hare* in the *Summer dress* (It is pure white in winter) pray do so and do not mind the price or the cost of its conveyance to me. This animal is abundant in the northern portions of your State and is fully double the size of the common *Hare* called the "Rabbit"

With sincerest regards and kindest remembrances to all around you and our mutual Friends,

believe [me] yours always

John J. Audubon

The "Parkman Wren"
well mounted will soon be
on your chimney mantle!

New York, August 13th 1841.

My Dear Friend,—

By Mr. Legaré who revisits your City, I have the pleasure of sending to you, the "*Parkman's Wren*" and I hope you will receive it in good order. We found it necessary to recaste the position of this little fellow on account of the many shots that passed through its neck when killed.

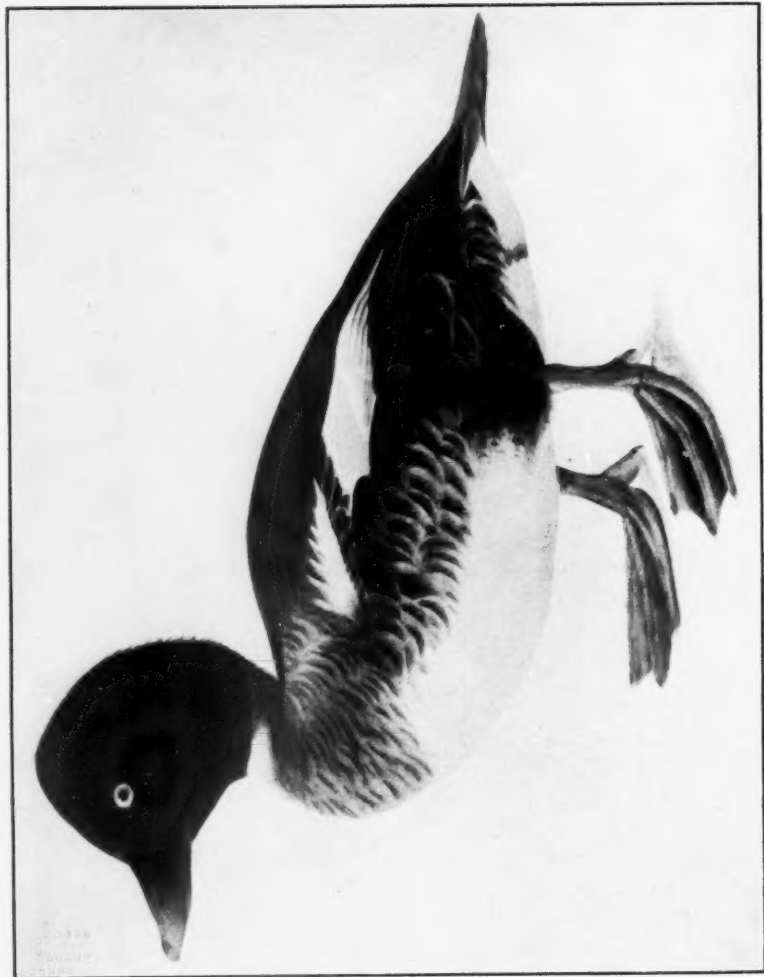
I also send you the numbers of the little work wanted by General Lyman which please have delivered to him with my best regards. I should like you to receive the money for those numbers, so as not to cause confusion in our accounts with Messrs. Little & Brown. I had the pleasure of introducing Mr. Legaré last year and therefor you will remember that Gentleman.

With sincerest good wishes to all the Dear ones around you, believe me always

Your attached Friend and Servant,

John J. Audubon.

1000
1000
1000
1000
1000



GOLDENEYE.
FROM AN ORIGINAL WATERCOLOR BY JOHN JAMES AUDUBON.

SOME AUDUBON LETTERS.

BY GEORGE BIRD GRINNELL.

For many years I have had in my possession a lot of Audubon papers, among them the two letters printed below from John James Audubon to his son Victor. For me these letters possess unusual interest — personal rather than ornithological — because of the light they throw on the naturalist's family life, and the suggestions they give as to his business methods and the progress of the great work. Then, too, the first was written just as he was leaving New York to start on his famous Labrador trip and the other just after his return. The letter here printed, however, is not the last one written to Victor before leaving for Labrador, for Miss Maria R. Audubon quotes from one dated May 16, 1833, which we may fairly assume was written from Boston.¹

The two sons, Victor and John, were at this time very young. Victor was about 23, and John only 20. John, in fact, had been so boyish as to cause his father some uneasiness. Yet on this expedition he showed that he possessed qualities which already made him of great service to his father. Later he became a painter of whom his father was proud, and it was John who gathered much material concerning North American mammals, which was published in the "*Viviparous Quadrupeds of North America*."

The young men referred to in the second letter were, of course, Joseph Coolidge, George C. Shattuck, William Ingalls, and Thomas Lincoln. John Woodhouse Audubon was the fifth.

My father was for many years a near neighbor of the Audubons. I attended a school conducted by Madam Audubon in the Victor Audubon house, where she lived, and as a boy I often saw Victor. I remember him as bedridden from an injury, and he died, I think, in August, 1860.

John Woodhouse I knew very well in the way that a small boy may know a middle aged man. I used to play with the sons of Victor and John Woodhouse about the houses and barns of the

¹ Audubon and His Journals, I, p. 67.

Audubon family, and John Audubon as a friend of my father's was often at my father's house. He was a bluff, gruff, but friendly man, and was always willing to talk about birds, mammals, or, indeed, any natural history object, to any boy who asked him questions. It was to him that I took a small "pigeon" which I had killed near our home, which he identified as a ground dove (*Chamæpelis passerina*). I noted the taking of this bird many years afterward.¹

John Woodhouse Audubon died in 1862.

The Audubon family and many of their kinsfolk were, of course, well known to their near neighbors. I used to see some of the Berthouds, Bachmans, Talmans and Mallorys, the latter being relatives of Mrs. Victor Audubon, Victor's second wife, who was Georgine R. Mallory.

Miss Eliza Mallory gave me the letters here printed. A room in the Victor Audubon house was being cleared out, and the old papers burned, and Miss Mallory suggested that as I was interested in birds, I might like some of these papers. They were bundled up and given to me, while the others fed a bonfire.

Among the papers which I have are many sheets which appear to be the printers' copy from which the "Viviparous Quadrupeds of North America" was set, a long letter from Thomas Lincoln, dated November 17, 1846, describing some of the larger mammals of Nova Scotia, and a half a dozen drafts of bird biographies in the handwriting of John James Audubon, material which no doubt was afterward put into good English by Audubon's great assistant, William MacGillivray. Among this material are also two or three sheets in the handwriting of Prof. Spencer F. Baird, whose association with Audubon was close for some years.

The letters follow.

New York April 28th 1833 —

My Dear Victor —

On opening the box containing the numbers last sent to this place for distribution, we found the contents wet and of course some of them damaged. We have however dried them and made of them that could be done and they will all go on Monday (to-

¹The Nuttall Bulletin, III, p. 147.

morrow) to their Several destinations — In future I recommend that Each parcel of numbers for the diferent individuals are rolled up in separate Parcel, inclosed in good stout brown Paper, and each directed outside, enumerating the numbers therein contained — then put all the Rolls in a Box — in this manner they all will be less liable to Injury, will not need to be undone here for we have no trouble at all at the Custom House, and it will Save the handling of the Plates at the Compting House.—

N. Berthoud rendered me his account yesterday I send you inclose a Copy of it — and I also send you a Copy of a general & particular memorandum left with him, by the assistance of which the Business is clearly exhibited, so that each Subscriber's Standing with the Work Shows at once.—

The Balance in our favour in N. Berthoud's hands is \$1358.91 — We have due *South of this* \$1834.48. and at Boston \$1220.00 — altogether \$4413.39! — The Boston amount will be ready for me when I reach there on Thursday next. — I take from N. B's hands here \$800.00. — 300 \$ of which I give to your Dear Mother — when at Boston I will take 500 \$ more and send the Balance to N. Berthoud — he will then have about \$1278.91 of cash out of which he will send you 100 £ say 480 \$ leaving still with him about \$798.91. besides what he will collect from the South the amount which is mentioned above, *all of* which I hope will be collected ere I return to this Place, as early as I can without losing the opportunity of doing all that can be done.

You will easily perceive by all this, that we have been extremely fortunate of late on this Side of the Water, and the 400 £ forwarded to you will fully enable you to meet the demands of Havell &^c for the 20 Volumes you have to send here & other emergencies.— We have at Present 51 Subscribers in the U. States, without the name of Doc^r Croghan from whom not a word has been heard, and also without that of *Baron Krudener* who is now at Washington City, but who has not taken any cognisance of the letter I sent him. N. Berthoud is going to write to him and I hope the Baron will take the work.— he certainly ought.

I found the Plates sent here better coloured than usual and with your present assistance I greatly hope the goodness of the Work will still improve.— Nicholas will forward you Two very beautiful Numbers — the Plates are as follows,

N ^o 37.	Plate 181.	Golden Eagle.....	Figures 1
	" — 182.	Ground Doves.....	5
	" — 183.	Golden crested Wren.....	2
	" — 184.	Mangrove Humming Bird.....	5
	" — 185.	Bachman's Warbler.....	2
<hr/>			
N ^o 38.—	" — 186.	Pinnated Grouse.....	3
	" — 187.	Boat Tail Grackle.....	2
	" — 188.	Tree Sparrow.....	2.
	" — 189.	Snow Bunting.....	3.
	" — 190.	Yellow bellied Woodpecker.....	2

I should have sent you 2 more Numbers had I The Two large Plates for them, but hoping that I may meet with something Large & perhaps New I Shall not do so, until I return which will be Still time enough.— I am very anxious to See the 2d Volume finished and for this reason invite you to push the Work, as much as you can & have it very well executed meantime.

The State of Maryland is Subscribed to by D. Ridgely M. D. Librarian of that State. he desires the 1st Volume and the following numbers forwarded as soon as can be.— Send it here — as he has authorized N. B. to draw on him for Payment.— Miss Harriet Douglass also desires to have her Number sent here for the Future.

I hope the Copies for Co^l Perkins & others at Boston & vicinity, as well as for W^m Oakes, & John Neale will soon arrive.—

April 30th — Since the above, I have obtained Two more Subscribers — the names of whom are

1. Rich^d F. Carman. New York
1. L. Reed ——— Do Do.—

I was told last night that the State has also Subscribed, but cannot tell until I see this day's Paper — Whilst at the Lyceum of Natural History last evening, I was promised their Subscription on Monday next — being the Society's day of business.

I have concluded to send the 2 Numbers of Drawings by this Packett — The Tin case containing them, will be given to the especial care of the Capⁿ on whom you will do well to call immediately.— I have *given* a 1st Volume to Nicholas Berthoud; there are many enquiries made to see the Work and it answers that purpose well.

John & I leave for Boston either this afternoon or tomorrow — perhaps tomorrow as we have much to do. — It is not probable that Ed^d Harriss will join us at East Port and go to Labrador with us — I shall write to you by every opportunity as these may occur, and doubtless from Halifax.

Mr Inman has painted my Portrait in Oil, and *I say* that it is a truer portrait of me than even the Miniature. — Now my Dear Victor exert yourself in the having all the Volumes compleated which I have written for — See that they are carefully packed with Paper between each &c &c &c I shall not close this until I have given the Box to the Capⁿ and when I hope to add the Subscription of this State. —

2, o'clock — I have just returned from the bustle of the Lower part of the City — *the State has* Subscribed! Therefore add that valuable one. There is no Packet for London Tomorrow, therefore the Drawings will go off on the 10th of May by the Capⁿ in whose particular care they will be given. — These 10 Drawings have been insured this morning against *all Risk*, for 2,000 \$ at $\frac{1}{2}$ per Centum — I hope you will receive them in perfect order; they are carefully packed by myself in a Tin Box securely sodered &c &c.

We have now 54. Subscribers in America.

Mr Inman is going to Paint the Portrait of your Dear Mother, and I have not a doubt that it will be "good & true"

The Weather is extremely Warm — the Thermometer ranges at nearly 72. The Martins are flying over the City and Tomorrow I shall fly toward the Coast of Labrador — If fortunate I shall bring a load of Knowledge of the Water Birds which spend the Winter in our Country and May hope to Compete in the study of their Habits with any Man in the World.

My Good Friend Charles Bonaparte as (I am told) taken unbrage at a Passage in My Introduction (first Volume) Which proves how difficult it is to please *every one* — I am going to write to him by Duplicate to try to *correct* that Error of *his* — God ever bless You my Dear Son and May We all meet Well & Happy

Yours ever affectionately,

John J. Audubon.

New York 9th Sept^r 1833 —

My Dear Beloved Victor.—

John and myself returned here in excellent health, day before yesterday, and had the good fortune to find our Dearest friend your Mamma quite well also — indeed, the whole family here are well.— before I answer or note the contents of your many valuable letters, I shall give you a sketch of our Voyage and a list of the new Birds &c which we did procure.— We sailed from Eastport on the 6th of June, followed the coast of Nova Scotia to the entrance of the Straights of Cansso through which we passed and were much pleased with, as it is truly beautifull resembling somewhat the Hudson River.— we made towards the Madgalane Islands, visited them, found them poor, no birds &c and proceeded to the famous Gannet Rocks and there saw a grand sight of Gannets & other water birds engaged in incubation.— went on to the Island of Anticotte and on the 11th day from our departure at Eastport anchored in an harbour at the Esquimaux Islands on the Coast of Labrador in Company with several fishing vessels. The aspect of the Country of Labrador was as new to us as it proved itself to be Wild, Rocky, Barren of Large Trees, covered with the deepest and richest coloured mosses and the richest of dwarfish vegetation peeping out of the mosses that one can Imagine — on first landing the whole appeared to us delightfully curious, but no sooner did we attempt to proceed in Search of Birds that we found our progress over the Country so difficult and so Irksome that our Spirits became much dampened, the more so indeed when we discovered that very few Birds were there to be found — to walk 10 miles per day was as much as the strongest of our party could well endure, and we all returned every evening as much fatigued as if we had walked 60 Miles on a Turnpike road.— for three hundred Miles of that Coast which we visited the Country was always the same; few trees of a very small size, Deep swampy moss ever and anon growing over hard, dark red looking Granit, supported by the constant foggy dampness of a chilling atmosphere without scarce an Inhabitant and becoming Wilder and Wilder as we proceeded; we landed first at latitude 51. visited, [some] hundreds of Sea Islands; Some hundreds of Inland lakes all Supplied with melted Snow waters — Snow laid deep in every Valey unexposed to the Sun and



MERGANSER.
FROM AN ORIGINAL WATERCOLOR BY JOHN JAMES AUDUBON.

we had to keep constant fires and clothe ourselves as we would do at Eastport in Winter — Yet the Musquitoes, and Black flies & Horse flies were as troublesome as they are in the swamps of Florida — we had storms almost every other days and rain in abundance — Yet we never gave up the task before us, that of procuring New Birds and ascertaining the habits of all the species which resort to that dreary Country during Summer to breed. We fell in Company with the British Surveying Schooner the *Gulnare*, commanded by Captain Bayfield R. N.— Lieut. Bowen, &c. and Doc' Kelly — all these persons being highly Scientific and Gentlemanly, were most agreeable Companions to us, and we enjoyed their Society much.— we gradually reached the Straits of Belle Isles about the 20th of August.— on the 15 July this passage was still much encumbered with floating Ice and Icebergs. on the 15 of August we had an Iceberg within 2 Miles of us fastened to the bottom, and looking most beautifull.— The season closing upon us we returned sailing along the Northwest coast of Newfoundland which we found stil more elevated, rugged and Wild looking than the Labrador coast; we anchored at the head of St. Georges Bay, Spent there a Week and ransacked the Country as much as the difficulty of walking would permit, and sailed for Pictou (Nova Scotia) near which we landed and from thence sent the *Ripley* round to Eastport where She arrived safely 2 days before us. We crossed Nova Scotia by way of Truro, Halifax and Windsor; at the latter place we saw the tide rise 60 feet — took a steamer to St John's, New Brunswick and arrived at Eastport all well and without having met with a single accident of note, or felt a moment of sickness except that occasionned by the motions of our vessel Whilst tossing over the Gulph of St Lawrence; the vilest of seas.— The Young Gentlemen under my care proved all to be excellent and useful Companions, and I frequently felt as if all belonged to our family. Yet I was glad to give my charge over, for my anxiety was truly great and often raised to a high pitch, when ever we encountered a storm out of Harbour.—

We have secured 8 New Birds which have given us 2 Superb large plates, and 6 Small ones.— The New Species consist of 2 *Falcos*, 1 *Finch*, 1 *Titmouse*, 1 *Cormorant*, 1 *Curlew*, 1 *Fly catcher*, —The other I cannot recollect just now. I made 25 Drawings,

all of which are not finished; but I have more than enough to Compleat the 2^d Volume to my entire satisfaction.— The 2 large plates are one, a covey of the Willow Grouse, male female & Young, very beautifull. The other the *Labrador Falcon* male & female, large & beautifull, John killed both these.— The knowledge I have acquired of the Water Birds and of those of the land which visit us only during Winter, is most valuable and I have Written *all I saw* — Our voyage has been very costly.— about 2000 Dollars; but I am glad I went, it will give me and the Work a decided superiority over all that has ever been undertaken or perhaps ever Will be of the Birds of Our Country.— Now I will give you an account of my plans for the present Year, and indeed for the next, *adopting however Whatever you* My Dear Son will say in return to this Subject I wish to Leave New York in about Ten days for the express purpose of procuring Subscribers, a good number of which I hope can be procured in the U. S.— and to proceed by way of Philadelphia to Baltimore, remain there a fortnight or So — then to Washington City where I expect to have the heads of the diferent dep^{ts} to Norfolk, Richmond & Fredericksburgh in Virginia and to Charleston and Savannah further South — at Charleston your Mamma and John to remain the Winter at our friend Bachman's who invited her to do so when he was here this Summer. Could I procure an additional number of 50 it would be a most valuable Journey, and I would besides [acquire] some information about Birds if not any New such.

Havell's last letter to us, shows I think a good disposition to continue the work on the same terms he has heretofor done it, and I think that the letter which I am going to write to him and of which I send you a copy inclose will restore him to his proper senses.— I feel confident that he does not lose *by our Work*, whatever he does in other speculations, and *I think* that should we remove it from his hands into any other persons that his name would soon suffer as well as his business.

I am truly delighted at the contents of all and every one of your letters my Dear Victor.— I am indeed proud to have such a son — I look on your prudence, your improvements and your Industry as unparalled in a young man of your age, in a Word I look upon you as on a true friend and a most competent partner in the completion

of the arduous undertaking before us.— I cannot say any more, than that I and your Mother are quite Happy at the knowing that you are so well able to do all for us and for yourself that we could possibly desire.— to go on in the same manner is all we can wish, and we feel perfectly confident that you will do so.—

We are all anxiety to hear from you after your return to England from your visit to the Continent, and [should] you not have procured a single subscriber, it is well to [have] ascertained the fact that none were there, besides the knowledge which you have acquired of the Nations you have visited — a knowledge which no description can ever convey.— to speak the French Language alone will be of great import to you.— We hope that you Draw Some, and also that you study music at your leisure hours, however few these hours may be.—

When at Philadelphia I will ship direct from that City the Bird skins, shells &c not belonging to our private Collection for you to dispose of as opportunities offer.—

I am greatly in want of *One dozen or So* of the best French water colour brushes of assorted sizes made in Paris —

Pitois can send them to you. They cost from 5 to 8 Francs each and are made good only by Vial Lebault, successeur de Cherion, Fabricant de Pinceaux N° 61. Quai de l'horloge du Palais, pres du Pont Neuf, a Paris. *Some very large, none very small.*

In the first volume of the "Birds of America" there exists 2 repetition of species, "The Female Turkey" and "the black and Yellow Warbler" — and in the 2^d Volume one repetition — "the Young of the White headed Eagle" This renders the numbers of actual species less by three than 200 the proper number intended these Volumes should Contain — I now think that the character of the work, and the fame of the author, would be greatly enhanced, by *giving* 3 extra small plates in the last number of the 2^d Volume; it would be fulfilling to the very letter the promises to subscribers contained in *The Original Prospectus*, and would the more enable us to enforce the taking in of the Work by all those who have affixed their own signature to the original list of subscription, and have so unwarrantedly abandoned it since the time they subscribed.— The extra cost of these three plates would certainly be considerable, but it would I think work well and exhibit an unpre-

cedented Generosity in Works of Any Description — Think of this, talk of it to our most excellent friend Children, and write to the Rathbones also on that subject and let us know all — Meantime I shall send you the Drawings for the 2 last numbers, the very last consisting of 8 Drawings instead of 5. — These numbers surpass all that have been published in point of Interest and beauty. — although there will not be any more labour for the Engraver or Colourers than previously. —

I would regret indeed to be obliged to remove the Work from Havell's hands unless forced to do so by not meeting with another person equally competent and at the same prices which we now pay, it would have to be done; for between us, I think it very ungrateful in him to have even mentioned such an Intention. — He says you both agree very well *now* — I hope it will be long the same thing, and I am quite sure that your diligence at overseeing the Work was a great source of discontent on his part — but we have to look for and to think of our own Interests quite as much as any other in this boisterous World of ours.

Present my thanks to Friend Bell of the London Atlas and ask of him to publish the long paragraph in the paper which accompanies this — I am writing to the Duke of Sussex — deliver the letter yourself. — Remember me most kindly to Cuthbertson who is indeed a most excellent friend of ours.

When you have a good opportunity, see if the 2 first Volumes could be printed *in Colours* and bound in Paris, the Price &c, You furnishing *English Paper* for which I think *no duty* would have to be paid in France, for Such a work —

I would like to go to England the 1st of June next to publish the 2^d Volume of Biography, and yet I would like to remain in the U. S. one Year more to compleat the Water Birds as far as in our power. Send us your Views on all subjects and we will [decide] as may be best from your letters —

Tell Havell that the Water Birds will not be more troublesome than the Land Birds and that although some Landscapes or portions of backgrounds will be attached to each Drawing; these will not be more than equivalent to the Plants &c of the Land Birds. I am glad that what you say of *the Young Engraver* there coincides with my opinion of him — Keep Kidd at work as much as possible

and take away from him the Paintings and Drawings when ever a good opportunity offers, those would be better in your possession than in his at any time.— I do not like to send the original list of subscribers to you now — it has a considerable effect in the eyes of those who think of subscribing here, but I can send you the names of *all who have signed it* and shall do so: —

Now our Dear friend and Son, I will speak of your Dear Brother John — I have been extremely pleased with his Industry, and the loss of many of his boyish habits — indeed it was a great consolation to have him for my right hand man on all occasions — he lost no time whilst on this voyage, and I am glad to say that I have discovered in him, such dispositions to instruct himself — his memory is excellent and his powers of observation equally so — he needs only to be constant in his application to study, to render him as yourself are, the purest Source of this Life's comfort — never did music sound sweeter to mine ear, than the soft strains of his Violin which most fortunately was taken with us into the Dreary regions which we visited.—

I will now put this aside and write to Havell — This goes to-morrow and I may find more to say — indeed I will speak of the subscribers here, at Boston &c although not at length as I have an immense quantity of other letters to write at present and in a hurry —

Should you prefer writing to Mr Musson who probably will be in Paris do so, for the Pencils or brushes — or to Mr Green.

I have read your answer to that crazed man Watterton — it is good, but I am of opinion that to say nothing in reply to all such nonsense is the best way of punishing both the writers and publishers.—

Whilst at Boston I received the amount up to this date [due] by W^m Oakes and Mr Arnold, the rest remained unpaid and [I put the] collection in the hands of Doc^r Parkman who is as much [as ever] a most excellent friend of ours.— Nuttal is now engaged in the Publication of his Water Birds and I am going to give him a few small, matters, which he will publish as my own and has a tendency to keep our name before the Scientific World — he is I think a good and true man — Now my Dear Son I will close this and write again very shortly — God bless and prosper you — John

and Mamma join me in those wishes and I remain for ever Your affectionate Friend & Father —

John J Audubon.

Tell our Friend Children that I shall soon make a Shipment of Insects to him.

MORE LIGHT ON AUDUBON'S FOLIO 'BIRDS OF AMERICA.'

BY SAMUEL N. RHOADS.

THE following transcript of a clipping, which, from the character of what is printed on the reverse side, appears to have been cut from a New York City newspaper of January, 1838, I recently found laid within the leaves of an old book. It confirms my belief, long entertained, that the estimates placed by bibliographers and historians on the number of published copies of the first (Elephant Folio) edition of Audubon's 'Birds of America' were much too small.

Mr. Ruthven Deane, whose researches in Auduboniana cover a long period, writes me that "it was believed from creditable information that the number of copies published was *seventy-five*," and that "the Audubon family [descendants] believe that was about the number."

My experience in the old-book business during the last fourteen years, in which time I have examined or personally known of the sales of forty or fifty copies of this folio edition in America alone, was sufficient reason for placing the probable number of copies issued at considerably above one hundred. In the past twenty years it is probable that one New England print-dealer has broken up thirty or forty volumes of this magnificent work, selling the plates separately for framing and other illustrative purposes. The newspaper clipping is as follows:



GOLDEN-CROWNED KINGLET.

FROM AN ORIGINAL WATERCOLOR BY JOHN JAMES AUDUBON.

1000

"THE BIRDS OF AMERICA. BY J. J. AUDUBON, F. R. S., &c.

When only a few numbers of this Work had been published, Mr. Audubon was informed that many gentlemen, as well as a considerable number of Natural History and other Societies, Libraries, &c. were desirous of possessing it, but that the time to be occupied in the publication, (16 years) was so great, the casualties of life so many, and the probability of its ever being finished, therefore, so remote, they determined to wait its completion before they subscribed.

With respect to many Societies, moreover, the rules preclude them for the above reason, from subscribing to any work of this kind published periodically.

Mr. Audubon, therefore, feels desirous, for the information of such persons or Societies, to announce that seventy-eight numbers have now appeared, and that with seven more it will be completed. He confidently expects to present the last number to his subscribers on the 1st of April or May next.

As a comparatively small number of persons only are acquainted with this work, for the information of others, it may be well to observe that the whole of the Birds (about 470 Species) known to inhabit North America with the exception of those of Mexico and Texas, are exhibited.

The figures are all of the size of life, after drawings made from nature, during the last thirty-five years; and the Birds are accompanied by a very large number of Botanical Specimens, some of them not figured in any other work.

This Publication was commenced in 1826, and the Prospectus then issued anticipated a period of sixteen years as necessary for its completion; of that term only twelve years have elapsed, and in six months more it will be terminated.

In addition to the fidelity with which every Bird and Plant is represented, this work has another great attraction, from the circumstance that it forms a complete history of the Birds of America, and will in after times be a point from which to institute a comparison for the purpose of ascertaining what changes civilization produces in the Fauna of our great continent.

It was contemplated that eighty numbers would finish the Work; but in consequence of new and rare species having been recently discovered by the author, and also received, from the Prince of Musignano, Thos. Nuttall, Esq. Dr. John Townsend, and others, eighty five numbers will be required (in which will be included the Eggs of many of the Species).

The particulars of the plan of the work may be reduced to the following heads:

The size is whole sheet double elephant, the paper being of the finest quality.

The Work appears in Numbers — each consisting of five Plates.

The price of each Number is \$10, payable on delivery.

The number of perfect copies at present subscribed for does not exceed 190, of which upwards of 80 are subscribed for in America; and the expense of getting them up is so great, that not more than ten or fifteen copies above the number subscribed for, will be prepared,

The Establishment necessary for its publication will be broken up when the last Number is colored; and any application for the Work must be made to N. Berthoud, Esq., New-York; Dr. Geo. Parkman, Boston; Rev. Jno. Bachman, Charlestown, S. C.; James Grimshaw, Esq. New-Orleans, or W. G. Bakewell, Esq., Louisville; before the 1st of May next, as after that time no subscription can be received. New York, Jan. 11, 1838. jall eed8w"

THE CALL-NOTES OF SOME NOCTURNAL MIGRATING BIRDS.¹

BY WINSOR M. TYLER, M.D.

No matter how carefully we watch the land birds in our vicinity during the latter part of the summer with a view of ascertaining when they leave their breeding-ground to begin their southward journey, we rarely see any evidence of migration in Eastern Massachusetts before the middle of August. Our first intimation, perhaps, that a species has left us is within a few days of August 15. The Yellow Warbler's song then drops from the summer chorus. This species is common and sings freely until a certain day,—generally between the 10th and 15th of August; after this date we no longer hear the song and we no longer find the bird in the vicinity until weeks later, when a few migrants pass through this region in September. Although the Least Flycatcher's song period is over some time before that of the Yellow Warbler, this bird (the Flycatcher) lingers on its breeding-ground apparently, for it is not uncommon to find a silent Chebec on any day in August, and, like the Yellow Warbler, Chebecs, as migrants, occur occasionally in September. But before even the Yellow Warbler has left our garden shrubbery, the autumnal migratory flight has been long

¹ Read on Jan. 17, 1916, at a meeting of the Nuttall Ornithological Club.

under way. Every night early in August, or even late in July, we may hear hundreds of bird-calls from nocturnal migrants, as they pass over head southward in the quiet and darkness.

For the past few years I have been much entertained and fascinated by listening from my sleeping-porch to the notes of these migrating birds. Being practically out-of-doors, my attention was naturally drawn to the frequent clear-cut "chips" and whistles; they were so distinct and sharp, and apparently so near, but withal so mysterious and baffling as to arouse my curiosity. One is at first impressed by the fact that most of the call-notes which he hears over and over again, often in great variety, are notes which he has never heard before, and consequently can ascribe to no known bird. Again, after a few years of observing, one realises that each year the notes (at first strange and unfamiliar, but finally perfectly recognisable from one another) occur in a definite order; as the season advances, one note after another makes its appearance, becomes frequent, and later drops out to be heard no more. Here then is a basis to work on. From the known times of migration of certain birds, is it not possible to identify the authors of some of the common nocturnal notes, or at least to surmise their identity with a fair degree of certainty?

During the very first nights of the autumnal migration (July 29 is my earliest date) the notes are always the same,—high and sibilant, with a sharp, ringing quality. The sound is represented so closely by the letters "ks" that I have called this note the "x" note. This call contains no vowel sound,—it is so short, indeed, that it cannot contain one—it is over almost as soon as it begins. In spite of the necessarily vague idea one receives from reading a description of so indefinite and fleeting a sound as a bird's "chip," this note is perfectly recognisable; after one has once become familiar with it, he can distinguish it readily even when it occurs, later in the season, with many other calls. The "x" note, as I have said, is the first note heard in the autumnal migration. It is commonest during the first half of August, when it is heard on favorable migration nights almost incessantly, evidently from thousands of birds, and it disappears soon after the first of September. From these facts we might deduce, that the species which uses the "x" note as a migration call is a nocturnal migrant which

breeds in large numbers to the north and northwest of us, that the species breeds also in eastern Massachusetts (for even when we hear the "x" note most frequently, we find in this region no species which have not bred here) and finally that its southward migration through this vicinity is pretty well over by the middle of September. I regret to say that, with all these data, I did not surmise the identity of the author of the "x" note until I saw and heard the note uttered in the daytime by the Oven-bird. Then it seemed self-evident that of all the possibilities, this species best supplied the conditions. The discovery also explained the early disappearance of our resident Oven-birds.¹

It may appear strange that the Oven-bird should give its nocturnal call by day (the call is distinctly different from any call used by the young or adult of this species) but under certain conditions, birds of several species add to their regular diurnal vocabulary a note absolutely novel, and in a few cases I have been convinced that they were using their migration call-note. Usually the birds uttering these notes are migrants,—either birds like Thrushes, remaining over a day or two between their night-flights, or Warblers, flitting southward through the trees, continuing, as they feed, their migratory progress. But birds about to migrate, as well as those already under way, signal to each other in a like manner.

Perhaps the most familiar example of this phenomenon is furnished by the Chipping Sparrow. Soon after the second brood of young is fledged, our local Chipping Sparrows gather into families or groups of a dozen or more. At this time, long before their departure in October, we hear from our open windows a bird-note which we have not heard during the early summer from the Chipping Sparrows which have bred within hearing. It is a note which to our ears suggests migration, both from its general resemblance to the indefinite "chips" which many migrant birds utter as they pass southward by day and by night, and also from the fact that the note is usually given when the bird is in flight. The Chipping Sparrow utters this note only when flocking, and it serves probably to maintain the unity of the flock. The effect of the migration calls, too, is to keep the companies together, but perhaps a more

¹ I have heard the "x" note only once in spring,—during the night preceding the arrival of the Oven-bird in Lexington.

important use of the call-notes is to express the feeling of migration and spread it, so that other birds may catch the contagion. In other words, we must not assume that a bird utters its migration calls with a definite purpose either of guiding its companions or of inquiring their whereabouts. Both of these results, however, are doubtless accomplished by involuntary utterances excited by the restlessness which culminates in migration. In any case there would be as much occasion for the notes which accomplish these results at the very start of migration, or even before the start, as at the subsequent steps of the journey.

It is possible that the migration calls are largely uttered by young birds and take their origin from the first note which the nestling makes,— the food-call. It is an easy transition from the food-call of the nestling to the call which the fledgling utters to inform his parents where to find and feed him, and this call, modified somewhat as the fledgling grows older, might well persist as an expression of emotion and become finally the migration call.

Some time in the second week of August, a new note makes its appearance, — a clear, but softly modulated, mellow whistle. This note is so loud and striking that one would expect that it would have attracted the notice of anyone who chanced to be out-of-doors at night. But, as far as I know, none but ornithologists have interested themselves in the sound.

For a long time this call-note remained a mystery to Mr. Faxon and Mr. Brewster, until finally Mr. Brewster, by a most fortunate chance, solved the problem. He was lying at dawn in his cabin on the shore of the Concord river, when he heard, far in the distance, the familiar whistle of the unknown migrant. The bird, still calling, flew nearer and nearer until it alighted in the shrubbery close by the cabin. Here it continued to call, but gradually changed the character of the note until, little by little, it grew to resemble, and finally became the familiar call of the Veery. This observation proves beyond any doubt that the Veery is the author of one of the whistles which we hear in the night during the times of migration and that the Veery's migration call is quite distinct from its notes heard commonly in the daytime. I should add that a small number of these calls (perhaps one per cent.) are identical with the Veery's diurnal "wheoo" call.

One other observer has published some evidence on this subject.

Henry H. Kopman (Auk, Vol. XXI, 1904, pp. 45, 46) heard the Veery utter by day a note which had puzzled him for years as he heard it from nocturnal migrants. It is evident, however, that he may not have differentiated this note from the calls of other Thrushes, for, although he had heard "countless hundreds" of the calls, he had noted less than a score of Veeries in ten years of observation, while he had met the Gray-cheeked and Olive-backed Thrush "in astonishing numbers" at the very season when he heard the nocturnal whistles.

The Veery call is most common in late August; my earliest and latest dates are August 12 and September 5. On some nights the calls come so frequently that, at times, there are but a few seconds between them; on other nights there is scarcely one to be heard,—a point of difference from the comparative regularity of the "x" note.

After the Veery call ceases for the season, there is generally an interval of about a week before a second whistle is heard. Although of the same general character as the Veery call, this late September whistle is pitched higher. It is of somewhat less duration, and is inflected downward very little, if at all, and lacks the terminal roll or roughness characteristic of the Veery call. My notes for the past four years indicate the migration period of this later bird to be between September 8 (an extremely early date) and September 27. I may say that these two "Thrush whistles" and the note next to be considered are so nearly identical that, for two or three years, I did not distinguish between them clearly, hence, I cannot use the dates contained in my earlier records. The late September call is a very frequent note on nights of heavy migrations,—so frequent as to indicate that it is uttered by a very common migrant. For this reason I believe that it is the call-note of the Olive-backed Thrush, in spite of the fact that of all diurnal bird-notes, it most resembles the whistled "hear" of *Hylocichla a. bicknelli*. An article in 'The Oölogist' (Vol. XXXI, 1914, pp. 162-166), by Paul G. Howes deals with the migration call of Swainson's Thrush. Mr. Howes' studies were made during the autumn of 1912 at Stamford, Conn. He describes the migration period as materially longer than my records indicate, his last bird passing southward on October 17. Mr. Howes was fortunate in being

able to watch the Thrushes drop from the sky into a small wood where he could afterward examine the birds at short range. He secured five specimens. Although I have gone out-of-doors in the morning twilight repeatedly in August on days when I have heard the whistles in great numbers before daylight, I have never seen the birds (Veeries at this date); as soon as it has grown light enough to make out a bird in the air, the calls have stopped and no more birds have flown over.

The Thrush calls heard during October, generally in the latter part of the month, are very similar to the Veery whistle. This third Thrush whistle is heard very irregularly,—on most nights none at all, but on a few nights in very great numbers. At this season of long evenings, it is not uncommon for the birds to start on their night flight as early as six o'clock. In tone of voice this note, a soft nasal whistle, resembles the Bluebird's call. It has, however, but one syllable and is inflected downward in pitch very slightly,—often not at all. The letters "Per" or "Ter" suggest the call. On October 29, 1913, I saw a company of half a dozen Hermit Thrushes repeat this note frequently as the birds flitted about in a gray birch wood. When they uttered the note they did not open the beak (at least at short range I could not see them do so), but at each repetition the feathers of the throat were slightly raised. During the previous night there had been a considerable flight of Hermit Thrushes and just before sunrise (a misty morning with a light S.E. breeze) I had heard numerous Thrush calls from birds passing overhead.

These three whistles heard respectively (roughly speaking) in August, September, and October account satisfactorily, I think, for the Veery, Swainson's, and the Hermit Thrush. The two other *Hylocichlae*, the Gray-cheeked and Bicknell's, are of comparative rarity in Eastern Massachusetts and their periods of migration here coincide practically with the passage of the Olive-back. It is very probable therefore that I have not distinguished the calls of these rarer Thrushes because their voices vary little from the calls of the abundant Olive-back.

During the month from mid September to mid October there are more nocturnal bird-notes to be heard than any other time. The majority of these calls to my ear are identical to the common

diurnal note of *Dendroica striata*, viz. "tsit." On account of this correspondence and from the fact that at this season, Black-polls are passing through Eastern Massachusetts in numbers which at times seemingly surpass all other birds combined, I think it is no unfair assumption to ascribe this, the commonest note of autumn, to the Black-poll Warbler. As the season advances, many of the notes are more sustained than the abrupt "chips" which suggest the warblers, and resemble the "tseep" note which is used in the daytime by several of the smaller sparrows. These notes become progressively more frequent, reaching their maximum abundance, perhaps, toward the middle of October, and are the last notes heard in the autumn before the migration ceases. That these notes represent the passage of various species of Sparrows, I think there is little doubt. The frequent occurrence of these notes during the evening of March 28, 1908, at the height of the sparrow migration that spring increases the probability. As to the identity of many other notes heard during this period, I do not hazard even a guess. As an indication of the real individuality of some of the nocturnal bird-notes and of the actual ability of an observer to distinguish between them, I may say that during the remarkable flight of Cape May Warblers which passed through this region in September, 1914, I heard a note absolutely novel to me. I heard it before I saw any of the Cape Mays and of course had no idea what it was until I noticed that the Cape May Warblers used this note when they flew from tree to tree.

The migration note of the Bobolink is diagnostic; it is used by day as well as by night, but in my experience it is rarely heard at night, although it is a common note in the very early morning, after daylight, when the birds may be seen flying in flocks. My explanation of the rarity of this note at night is that the birds generally fly so high that their notes are nearly or quite inaudible from the ground. At other observation stations the Bobolink's note may, very likely, be heard more frequently. I was fortunate, one spring, to see numbers of Fox Sparrows start on their night flight soon after sunset. The birds flew northward, at first from one tree to another, uttering, while in the air, a note not dissimilar from one of their sibilant "chips." I heard this note that evening from birds flying through the darkness against a cold northwest

wind (April 4, 1908). Weather, indeed, appears to have little influence on the migration of birds, as evidenced by their call-notes, except that on fair nights the birds evidently fly high; the calls are fainter and appear to come from far away, whereas on nights when the sky is overcast (or when it is raining) the birds seem very near.

In watching birds during the seasons of migration or in listening to their call-notes night after night, it soon becomes apparent that, quite irrespective of the weather, certain nights are chosen to move northward or southward; there is either a migration or there is not. The birds appear to recognise the migration nights in advance as if the individuals of one (or related) species possessed the knowledge in common. My notes give a striking illustration of this point. "On October 11, 1914, in the late afternoon when Mr. Walter Faxon, Mr. Lewis Dexter, and I were crossing the Ipswich sandhills, Myrtle Warblers continually flew over our heads, all in a southerly direction. In ten minutes we counted twenty birds, flying at the height of a tall elm tree. We were standing among the dunes about a quarter of a mile from the sea. To the south was a small wood of pitch pines surrounded by sand, and as the birds were flying toward these trees, and as they appeared to fly lower as they approached them, we thought at first that the birds were seeking a roosting place. But when we entered the wood, we saw that, although the Warblers often dipped toward the tree-tops in their flight over the wood, they did not alight, but continued on toward the south. After watching the birds fly over for half an hour in a steady, if rather straggling, procession, we felt certain that they had begun a migration flight which they would keep up all night. We first noticed the birds between half past four and quarter to five, in broad daylight (sun set at 5.11). The birds were rather widely separated from each other as a rule, but occasionally one approached another and swooped at him. Once, when a bird was attacked in this manner, he came down into a thicket of bayberries, closely followed by his pursuer. The two birds remained in the shrubs but a moment, however, before rising and continuing their southerly flight. As the birds passed over head, they gave their characteristic "*tcheck*," and almost as frequently, the sibilant call heard most often when they take short

flights. As I have never heard the "*tcheck*" note during the night from migrating birds, I presume that Myrtle Warblers make use mainly, if not solely, of the sibilant note as a migration call, once the flight is well under way.

"On the afternoon of the 12th (the next day) the behavior of the Myrtle Warblers at twilight was very different. Mr. Faxon and I had spent the afternoon at Coffin's Beach, Gloucester, and toward dusk we crossed a broad area of level land, just back of the beach, grown up thickly with bayberry bushes, with a sprinkling of blueberry and a few pitch pine trees. This growth made a dense tangle of branches not rising more than six feet from the ground (except in the case of the pine trees) and over the whole expanse one spot was pretty much like another. Throughout this space, Myrtle Warblers were hopping about restlessly, chipping excitedly, and taking short flights. As it grew darker, the birds quieted; they remained longer in a bush when they found one to their liking and hopped among the branches, evidently searching for a comfortable and safe perch to sleep on. They allowed us to step very near them before they flitted away to a neighboring shrub. The birds did not appear to gather into flocks or companies; two or three, to be sure, might be examining the same bush, but everywhere over the area of forty acres or so, as far as our eyes could see, scattered birds were settling for the night; evidently there was to be no Myrtle Warbler migration. We noted these birds between 5 and 5.15 P.M. At this time there were no birds flying into the field as there would have been if the Warblers were assembling from a larger area."

It is not always possible to estimate the magnitude of a flight by the number of bird-notes heard during the night. Extensive migratory movements often occur in spring during a night when few, if any, notes are heard, and conversely, one is often surprised in the autumn to find the country practically barren of bird-life after a night during which birds' "chips" have been heard in great numbers.

This latter condition may be easily explained, I think. During the night the birds are passing in hundreds or thousands, but at dawn each bird or flock settles near wherever it happens to be. Hence in any one locality, once the stream is stopped, there will be

comparatively few birds,— only those which were nearly overhead at sunrise. As a matter of fact, some birds do not alight until long after sunrise, and some others continue their northerly or southerly progress after alighting in the trees, but the explanation above accounts for the seeming diminution of the number of migrating birds when the night's flight is over. To explain the heavy spring flights when no nocturnal notes are heard, it must be understood that bird-notes are very rare on any night in spring. The contrast in this respect between spring and autumn is so striking, that we are led to believe that during the spring nights, we do not hear notes from migrating birds because they do not utter them. If the birds do call during their northward journey, practically all of them fly at a great height, thus adopting a very different manner of migrating from their habit in autumn.

Although the problems presented by the two migration trips must be essentially the same to the birds, it should be remembered that the personnel of the migrating horde differs in one important respect;— whereas, in the autumn more than half of the migrants have never made the journey before, in the spring, every individual has safely accomplished at least one trip. We have surmised that the migration-call may be an outgrowth of the young bird's food-call. Taking into account the frequency in autumn of the migration calls, as opposed to their comparative absence in spring, may we not further surmise that it is chiefly the birds of the year which we hear calling during their initial migration and that these young birds, returning over the path they travelled six months before, and flying with the assurance and self-confidence which experience has given them, do not need migration calls for guidance or encouragement and therefore do not utter them?

BIRD-WATCHING AND BIOLOGICAL SCIENCE.

SOME OBSERVATIONS ON THE STUDY OF COURTSHIP IN BIRDS.

BY JULIAN S. HUXLEY, B.A.¹

THERE is to-day, most unhappily, too often a gap between the amateur naturalists and the pure field-workers on the one side, and the trained biologists on the other. The blame, as usual, cannot be laid to the account of either, for both are guilty. On the one hand the professionals fight shy of amateurish methods and failure to see principles behind facts, while the amateur dislikes (often with justice) the other's dogmatism and his reliance on purely laboratory methods.

It is the purpose of this paper to try and show how, in ornithology at least, this gap may be bridged. There is a vast army of bird-lovers and bird-watchers to-day in existence, whose enthusiasm needs only to be properly directed to lead them into most absorbing fields, and at the same time to provide all-important material for fundamental problems of biology.

Three things only are needed:—A knowledge of what to search for, a method to guide one's searching, and instruments to use in the search. The instruments lie ready to our hands. It was, I believe, Charles Dixon who was one of the first to realize that the prismatic binocular had so enormously enlarged the potentialities of field observation. The possession of one of these instruments, though not absolutely indispensable, is of the utmost importance. In selecting a glass three chief points are to be considered. The first is high magnification, which enables the observer to catch the details of attitude and expression which are so important. The second is high light-gathering power and definition, which depend on the size of the object-glasses. Without this, high magnification is a snare and a delusion, involving strain on the eyes. The third is quick adjustment of focus, for following the action of moving birds. Many glasses are made with independent focusing adjust-

¹ Assistant Professor of Biology in the Rice Institute, Houston, Texas.

ments for the two eyes; these are useless for the bird-watcher. Some form of simultaneous adjustment is necessary, and in many ways the old pattern Goerz-Trieder longitudinally-moving focusing-head was preferable to the transversely-moving heads now in general use.

A magnification below six diameters is of little use; eight or ten is probably the best for general purposes, although even 12 will give satisfactory results. Besides a binocular, a telescope is often useful, especially for the larger and more wary birds. One with an object glass of at least two inches, and a magnification of about 25 diameters can be highly recommended. The price is comparatively small, and a little practice is all that is needed to handle it; one soon becomes so proficient that it is easy to follow even Swifts or Swallows in their aerial evolutions.

The efficiency of both the telescope and binocular can be considerably enhanced by a suitable stand. One that I devised for myself consisted of a camera-tripod with a kodak ball-and-socket joint attached; this in its turn screwed on to an apparatus composed of two pieces of wood lined with leather and joined by a long screw which holds the binocular in place. A special heavy ball-and-socket joint is also made by opticians for use with telescopes. By this means the fatigue and strain of holding the glass in place is done away with, and one's hands left free to take notes.¹

Before we go any further into the practical details of what to look for and how to look for it, it will be necessary to make what will perhaps appear a long digression on the theoretical side. The main biological problems demanding solution seem to me to be connected with the courtship of birds, and to that subject I shall here confine myself.

However, as I myself very soon discovered when I began working at the problem of Courtship, to get a real insight into it one must have a working knowledge of the theories of Evolution, the theories of Sex, and the theories of the Animal Mind. On these subjects I must refer the reader to the general works of Darwin, Weismann, Morgan and Washburn cited at the end of this paper. Here I will merely say that all my observations have gone to root

¹ See Huxley ('14), p. 529.

deeply in me the conviction that birds have a mind of the same general nature as ours, though of course more rudimentary: if they are automata, then so are we. Prof. Washburn's book reaches the same conclusion. As far as the problems of sex are concerned, bird-watching has lead me to important ideas, and has gradually made me believe that in birds at any rate an individual of either sex contains within itself the characters of the other sex in a latent condition.¹ With which preface let us plunge in *medias res*.

It is an old idea, and a favorite of Sir Thomas Browne, that

¹ This is not the place to discuss the theoretical aspects of the problem of sex. However, it will be well to mention one or two ideas to which such studies as these have led me.

Morgan, in his recent book just cited, brings forward various facts, largely as the results of castration experiments, to show that the *mechanism of sex determination* is entirely different in birds and in mammals (and again in insects). This is an important and notable fact, but in considering its bearings we must not be led to forget another equally important fact that emerges especially as the result of a comparative observational study — namely, that all the determinants for the sexual characters of both sexes are present complete in each individual of either sex (with certain exceptions when the male has different sex-chromosomes from the female), that this holds good for both birds and mammals, and that the different results in the two groups are due to differences in the *method* by which in any individual the right characters are brought out, the unneeded ones inhibited. This is shown very well by the fact that the requisite mechanism for the copulatory actions of both sexes appears to be present in individuals of both sexes. For instance, I learn from my friend Mr. W. M. Winton that he has personally seen two cases of bitches where ovariectomy was followed by the acquisition of male actions. Similar actions in non-operated female animals are familiar in cows (Muller, *Sexualbiologie*), and are recorded for rabbits (Washburn, *in litt.*). Pearl and Surface have recently recorded (Science, April 23, 1915) a most interesting case where a cow assumed not only the behavior but also the appearance of a bull, owing to cystic disease of the ovaries. These examples alone will show that in mammals the female carries within herself the determinants for the characters of the opposite sex, just as Morgan's results show the converse of this to be true.

In birds, the facts assembled by Morgan show at once that the female carries the determinants for male characters. For the converse proof, I have myself assembled some records where the male performs female actions (and *vice versa*), in my paper on the Grebe (Huxley, '14). The case of the Phalarope is, from a different point of attack, proof positive that the determinants for female characters are present in the male. In all species of Phalaropes (Phalaropodidae), while both sexes assume special plumage during the breeding season, and while this breeding-plumage is of the same general pattern in both sexes, and is obviously a recent acquisition in evolution, yet the female is larger and much brighter than the male, and in addition does all the courting. The only interpretation of these facts appears to me to be that, just as in most sexually dimorphic birds the male has acquired certain colors and structures, and that these have come to be shared by the female in lesser degree (Cardinal and many other Finches, Bob-white and most other Odontophoridae, many Woodpeckers, Yellow-headed Blackbird, Dickcissel, Scissor-tailed Flycatcher, etc.), so here sexual selection has helped the female towards her bright plumage, and the male has automatically come in for his share. The results are best interpreted if we suppose (as is cytologically reasonable) that the determinants for the characters, even though the characters themselves are acquired primarily by one sex only, at once come to be present in the germ-plasm of both sexes. Suppose it to be the male which acquires the secondary sexual characters. After this there are two possibilities. Either the inhibition in the female will not be sufficient to restrain some appearance of the new characters in her, even from the start: or else in some unexplained way the inhibition will gradually weaken and the female come in the

man is a microcosm, exhibiting in miniature all the activities of a universe; and as far as marriage customs go, the idea is a true one. In the single species Man are found many varieties of marriage — promiscuity, polyandry, polygamy, and finally monogamy in all its phases of refinement — in origin largely a hateful economic necessity, yet in the outcome proving itself divinest of possibility. Almost every variation that is found as a mere fluctuating phase in the history of man exists separately, as a rigid law, for some species of bird. Bateson, in one of his lectures, gives us an imaginary conversation between a Pigeon and a Barndoor Fowl. The Pigeon rebukes the immorality of the Fowl's polygamous estate, while the Hen retorts that the Pigeons neglect the welfare of their race by confining themselves to a single mate. The Fowl and the Pheasant have Harems of the Orient, one cock owning more wives than another less successful bird. The Blackcock's system in some ways recalls that imaginary one of Plato's, for here there is no marriage, but the males have their appointed station, and their duties are over when the hens have come and chosen out the best. Still more mixture of promiscuity with polygamy is found in the Ruff. There are savage combats in the Thrushes, tournaments and jousts in Redshank and Blackcock. The chase is as frequent an adjunct of courtship as it was, if we are to believe the poets, with the Greek gods and nymphs, and as it is in many savage tribes to-day. And if one watches a pair of Red-winged Blackbirds or Mockingbirds in such a pursuit, he is inevitably driven to the conclusion that sometimes at least there is in it a thrill of pleasurable excitement for the female, of which she is fully conscious, even to the extent, I think, of sometimes provoking the chase.

When there is a monogamous union, it may be a temporary one, for the season only, as in most birds, or a true life-marriage, as in most Crows and Hawks.

Some birds lay down that "a woman's place is in the home," and the hen exclusively undertakes the duties of incubation. An extreme case of this deprivation of freedom of the female is seen

course of time to resemble the male more and more closely. Whether or not this second process actually takes place, we do know of course that the inhibition can vary in extent, as is shown by the Reindeer, where both sexes now share a primitively male character, or the Pheasant, where the female shows practically total inhibition of the male characters, for the purpose of protective coloration. The decision between these two possibilities must at present be left open.

in the ^{Hornbills} ~~Toucans~~, where the cock walls up the sitting hen in her nest-hole in an old tree; there she remains, fed by him, till the young are ready to fly. Other birds come more near to the ideal of the women's movement of to-day; in them both sexes share the duties of the pair more equally, and in all activities realize themselves equally and to the full. The Grebes, the Herons and the Swans will serve as examples. Sex-difference and sex-consciousness in these seem to be less, and as a result, just as in Man in similar case, there is in their courtship and the whole of their mutual relation, not so much emphasis on the less real, less great things that depend on sex-difference — coyness, timidity, helplessness in the female, eagerness, vain display, superior physical prowess in the male — and more emphasis on the things that are more fundamental, because belonging to the race instead of to one half of it alone — enjoyment of what is to be enjoyed, sharing of what is to be shared, joint action, mutual help. Let anyone study the relation of the sexes in such birds and compare it with the sex-relation in species with marked sexual dimorphism; then think of what is meant by the logical outcome of the chivalric, mediæval idea of woman's place, and compare that with the ideal behind the better part of the woman's movement of to-day, and I believe he will understand what I have in mind, difficult though it be to put into words.

Restricting ourselves to facts rather than interpretations, it will be found that the majority of passerine birds are monogamous, pairing for the season only, — temporary marriage. The duration of this tie is very variable; it may last until the nest is built, until the young are hatched, until the young are fledged, or it may be merged in a family life lasting through the winter.

Some of the monogamous species are dull-colored altogether; in others the cock is more brilliant and does most of the courting; while in still a third group *both* sexes are adorned with colors or structures that are employed in courtship.

Other birds have true marriage; they pair for life. Such are the majority of Falcons and Hawks — in whom, however, the problem is made interesting owing to the fact that the hen bird is larger, more powerful, and more active than the cock.¹

¹ See F. Heatherly, ('13), where a magnificent series of observations and photographs on a single pair of birds is recorded.

At the other end of the series we get such birds as the Ruff (*Machetes*) which is polygamous, but still shows a certain degree of promiscuity as well.¹

Other polygamous birds, such as the Peacock and the Pheasants, have more definite harems; while in the curious and beautiful little Phalaropes, the whole normal relation of the sexes is reversed, the hens in bright-colored plumage courting the cocks, who in their turn undertake all the duties of incubation.

Enough has been said to show the variety and interest of these relations alone. By collecting all available data we shall first of all be able to correlate the marriage-habits with the classification. Since the classification is by now fairly natural, or in other words, since it groups together those species of birds which are related by descent, we shall then be able to trace the evolution of the various customs and instincts — to see what was the most primitive condition, and to trace out whether polygamy and other specialized habits have arisen once only, or independently many times over.

This is important from the purely zoölogical point of view; it will also throw light on various problems of Evolution, notably on the question of Parallelism or the repeated origin of one adaptation from different ancestral stocks.

It is obviously of great interest to the Sociologist, since here he can trace the beginnings of all sex-relationships, in creatures where emotion is not yet complicated by reason. And if we study the details of each history carefully enough we shall, I hope to show, be able to interpret the phenomena of consciousness — the emotions and desires that lie behind the actions, — with sufficient accuracy to bring much grist to the mill of the comparative psychologist. Do not think me fantastic if I say that, even in birds, I believe that the finest emotions and most comfortable happiness are, as in man, associated with that form of monogamy in which male and female bear approximately equal parts. To support my opinions I will refer the reader to those of Selous ('13, pp. 298-299) elicited by his watching of Wild Swans.

Three years ago such words would have been almost without meaning to me; it was not until I had spent weeks watching the

¹ See Selous' exhaustive paper in the *Zoologist* for 1906.

behavior of a single species¹ and more weeks trying to think out the meaning of my observations, that there came to me the point of view — a combination of the evolutionary, the psychological, and the physiological — which made that statement possible. It was forced upon me by the facts I saw; and those who wish to penetrate into those arcana and mysteries of science where the beginnings of Consciousness are being shaped and added to Life cannot do better than observe the behavior of a single species of wild bird or mammal, and, having observed, try to understand.

But this is a digression. Let us return to our consideration of the question of courtship. First and foremost comes the need for facts. It is important for the professional biologist to have many new facts. To get these he must turn to the naturalist and the bird-watcher; and for these latter it is enormously important to have the old facts summarized and correlated into principles, for otherwise they will be unconsciously biased by preconceived notions. In such questions as these of sex-relations, we tend to have an unconsciously-held theory of our own, based upon every-day experience of our own species and of domestic animals; and not merely that, but since the questions are in Man associated with morality, we tend to see what we want to see, even in animals.

Our first duty as scientific observers is to try to get a clear idea of the usual sequence of events. The majority of birds are monogamous, and among them the majority again pair for the season, the two members of the pair separating during the autumn and winter, and pairing again, usually with new mates, before the next breeding season. Such species can then be considered typical, and we will begin by describing what may be called the "Annual Love-History" of such a species.

The pairing-up occurs remarkably early, often months before any eggs are laid. St. Valentine's Day is the traditional day for birds to pair; but in many species pairing-up may occur before this. Then follows a long period before consummation — a true engagement — in which the pair is constantly together and various displays by one or both of the sexes take place. Later, well on in the spring, comes the true marriage, when sexual consummation

¹ Huxley ('14).

takes place. At the same time nest-building starts, and very shortly the eggs begin to be laid; and then follow in turn the period of incubation and the period when the young are still unfledged and must be constantly fed. Then the nest is left, and a period of family association starts, during which the fledged young are being taught to find their own food and fend for themselves. This family life may break up very soon (*e. g.* in August; the English Robin) or may last right on through the winter until the next pairing-season (many *Paridæ*).

Most of this is common knowledge. Recent work, however, is extending our knowledge in two ways. First, it is becoming clear that in many species pairing-up is even earlier than was supposed, sometimes even in November or December, and also that in a good many species which were supposed to pair for the season only, the union is really for life, the pair preserving its identity through the winter, sometimes even when flocks are formed.¹

In the second place, we are beginning to understand the relation of the so-called "Courtship-actions"—the displays and dances and songs—to the annual history. For example; there is often no display at all previous to the period of pairing-up; then—most interesting point of all—there may be a long period when "Courtship" (in the sense of active display by one or both sexes) may be very much in evidence, although the birds have already paired-up into couples, but coition has not yet taken place.

However, I think that it will be as well to look at some concrete examples of the various sorts of sex-relationship found in birds. I will take three, all more or less non-typical, to illustrate the great variety that exists in this matter of courtship.

I make no apology for beginning with a life-history which I have myself investigated—that of the great Crested Grebe²—for here I am sure of every fact.

In this aquatic species the two sexes are almost identical. Both are adorned with a beautiful crest, composed of two black ear-tufts and a ruff of chestnut, black, and pure white; this crest is very slightly less developed in the hen than in the cock, but is used exclusively in courtship, and used equally by both sexes.

¹ *e. g.* the Dabchick (*Podiceps fluvialis*) as reported by Mr. Mottram in a letter to me.

² Huxley ('14).

The birds generally go to the sea in winter, in small flocks or alone, returning to inland waters to breed in January or February. There, in February, pairing-up takes place — a process not yet wholly disentangled, but certainly associated with a great deal of flying and chasing (it probably resembles what happens in the Killdeer; *vide infra*). After this the pairs are very faithful — there is strict marriage for the season, preceded by a long engagement, for coition never takes place except on the nest, and nest-building does not begin till April. Quite soon after pairing-up, courtship activities begin, so that here, at least, pairing-up precedes any employment of the courtship structures (ruff and ear-tufts).

There are two entirely different sets of ceremonies gone through by the birds — ceremonies of mutual display, and ceremonies connected with coition.

The ceremonies of mutual display are extremely elaborate. There are three main divisions. The first is the simplest. Two birds that have been feeding or resting near each other will suddenly be seen to approach and to start shaking their heads at each other in a most peculiar manner, stiffly and formally, having first erected their crests and stretched their necks upwards to their fullest extent. After shaking for a certain time — a few seconds to a minute or two — they desist, and resume normal life.

The next form is amazing to see. It resembles the first in that it takes place as a mere interlude to the duties of every day, but is more elaborate. It starts with a bout of shaking which differs from the ordinary only in that it is prolonged to twice the usual length of time, and is followed by the remarkable diving for water-weed and the breast to breast collision which I have called the "Penguin-dance."¹

After this performance (which, I think, was the most thrilling sight I have ever seen while watching birds, with the possible exception of a Heron turning a succession of somersaults vertically downward from a height of several hundred feet to near the ground) they simply once more relapsed into ordinary existence.

The third form of display is mainly used when the two members of a pair have been separated. One will call for its missing mate. When the mate recognizes the call, it will swim in that direction,

¹ See Huxley, '14, pp. 499-500.

and finally dive. On this the calling bird changes its whole demeanor, spreading its wings out to display the white bar upon them, erecting its ruff, and drawing back its head, now rayed like the sun, on to its breast, white and puffed out. The diving bird approaches just below the surface, raising a ripple as it comes, and finally emerges just behind its mate in a strange stiff attitude:—"He seemed to grow out of the water. First his head, the beak pointing down along the neck in a stiff and peculiar manner; then the neck, quite straight and vertical; then the body, straight and vertical too; until finally the whole bird, save for a few inches, was standing erect in the water." From this extraordinary position the bird will gradually settle down on the water; its mate meanwhile turns round, and the two finish with a bout of shaking.

The most noticeable thing about all these ceremonies is that they are "self-exhausting"—they do not lead on to anything further. Looked at from the psychological point of view, they seem to me to be nothing but "expressions of emotion": the birds act thus because they are impelled to do so, because they enjoy it. Looked at, on the other hand, from the evolutionary point of view, they seemed to have been developed as a bond to keep the pair together.

In the other set of ceremonies, those connected with coition, the crest is not employed at all. The whole thing is more or less symbolic, the birds expressing readiness to pair by going into the extraordinary attitude adopted by the female during the actual act of pairing, when the bird "lies along the water" with neck outstretched to its fullest extent. The chief point to be remarked is that both cock and hen may adopt this attitude; indeed the proper qualities of either sex seem in this bird to have been in large degree carried over to the other.

There is one further interesting point to mention, namely, that *flirtation* is found in this species; by which I mean that one member of a pair (either cock or hen), if its mate is absent or unresponsive, will go off and perform the courtship ceremonies with a stranger. For further details, and for the jealousy thus produced, I must refer the reader to my original paper, merely remarking that we find some parallels to human affairs that give much food for thought.

In this species, then, we have elaborate Structures used only in

courtship, elaborate Courtship-actions gone through by both sexes, as a form of enjoyment (like a dance). We have Engagement and Seasonal Marriage, not exempt from Flirtation; we have special Coition Ceremonies, again shared equally by both sexes. We have in fact a Courtship which to one, like myself, who was familiar only with the facts adduced by Darwin and his followers, was a complete revelation — something entirely new and unexplained.

We will now turn to a modern investigation of a species which has figured prominently in the sexual selection doctrine from Darwin's time to the present. In the Blackcock (*Tetrao tetrix*, fam. Tetraonidæ) Selous¹ has made a series of careful observations, which show how totally different is the series of events in a species which exhibits marked sexual dimorphism combined with polygamy. The main unquestioned facts may be briefly stated. The cock birds are magnificent in a plumage of sheeny bluish-black with beautiful lyre-shaped tail. On the wing and tail are patches of pure white, while over the eye is a streak of scarlet. The female is so different as to merit a distinct name, the Greyhen; she is much smaller and of a dull reddish brown color speckled with black — a purely protective scheme of coloration. In these birds *the pair does not exist as a unit*. In April and May the cocks assemble early in the morning at regular meeting-places and go through various remarkable courtship-actions. The hens visit these assembly-grounds, and there coition takes place, several hens often mating with one cock. These are the main facts; their interpretation, as always, has depended on the closest watching of the details. Selous finds that what really happens is as follows. The cocks have definite stations or territories of their own on the assembly-ground, which they do not leave except under the influence of violent excitement, such as jealousy. Their actions fall into three main categories: — the ecstatic *dance*, not executed specially before the hen; a *display* performed directly to the hen and battles (which, however, are in reality but jousts, or sham-battles) between cocks.

The dance has often been described; at its most violent, it must be an amazing spectacle. The tail is spread out and erected, the wings a trifle drooped, the head alternately raised and lowered.

¹ Selous ('09).

In this attitude they run and leap over the ground, often turning partially round in the air, getting more and more violent as they go on, until, like Dancing Dervishes, they have made the dance an ecstasy of violent motion. Selous only once saw this dance in its perfection; but there are always rudimentary stages of it to be seen, when the birds, in the position described, would walk or run quickly over the ground, with now and then a little leap. The whole process, especially in these incipient stages, seems to be merely an outlet for the strong sexual emotion of the cocks, for they perform in this manner even when no hens are on the ground.

At intervals, hens visit the assembly-place; it is very rare for many to be there together. The arrival of one is usually signalled by a general commotion among the cocks, all leaping and dancing as above described. As, however, she walks from one part of the ground to another, each cock displays before her as long as she is within the limits of his particular territory. This display is entirely different from the dance. Instead of being a wild expression of passion, it is pompous and slow, and is adapted for showing off all the colors and contrasts of the cocks' plumage. The tail is again fanned, the wings drooped and spread to a considerable extent, the head held down and forward. In this attitude the cock passes first on one side of the hen, then on the other, and as he passes he tilts his body so that the brilliant upper surface of body and wings is towards the hen.

The hen may "reject" her suitor, by simply walking on to the station of the next male; the males have no means of enforcing their desires if she does not show her approval, which she signifies by stooping and finally crouching in the position for coition. A hen may be courted unsuccessfully by several cocks and then choose (*choose* is the only correct word) another; or she may leave the ground without favoring any of them. From Selous' observations (for the details I must refer the reader to the original) it is quite clear that the hens come to the ground for a definite purpose—to be stimulated sexually, to put it in the most physiological way—and if the stimulus is not sufficient they leave the ground without coition taking place. The stimulus is given by the display of the cocks, and one may be successful where another fails; success depends therefore on the variations in the males, or on the whim of the female, or, most probably, on both combined.

The fighting, finally, is very curious. There are a great many warlike preliminaries, a good deal of sparring and feinting, but only once in a long while any real hard fighting, such as many smaller birds indulge in—Tits and Thrushes, for instance. The whole business comes to be half ludicrous, half contemptible to watch. Selous' idea is that it has degenerated from real fighting and is now fixed as a ceremonial action. At any rate it appears never to decide anything—nor does it seem to have any influence whatever on the hens. In this species, then, we have a fine "expression of emotion" in the shape of the Dance, but here it is confined to one sex instead of existing in both, as in the Grebe. We have also a Display as a direct stimulus to coition, and working out in such a way as to make Darwinian Sexual Selection operative; and we have sham Fights, whose downward development has probably gone hand in hand with the upward development of the Display.

As a third, and again very different form of history, let us take that of the majority of the Old-world Warblers (*Sylviidæ*) so thoroughly worked out by Eliot Howard ('07). These birds include a number of famous European songsters, such as the Black-cap, Garden Warbler, and Marsh Warbler. They are mostly of very sober plumage, with little or no sexual dimorphism (though to this the Black-cap is an exception). The majority of the forms are migratory, and it is to these that we will confine our attention.

The course of events is similar in almost all the species. In March and April the birds come over to England from the South, in flocks and bands, which, following the river valleys, gradually split up as they spread over the country. The influx of migrants occurs in successive waves, and an important point to notice is that the arrival-period of any species takes a considerable time. The average immigration period lasts for about four weeks, but in some species it is only about three, while in others, like the Chiff-chaff it may extend to seven (and in some species of the closely related *Turdidæ*, even to 9 or 10 weeks).¹ Nests with eggs are usually found before the migration is complete.

¹ See Annual reports on the immigration of summer residents, published in *Bulletins of the Brit. Ornithol. Club* from 1906 onwards.

In all the species, the male arrives a week or more in advance of the females; this week is spent in the acquisition of a definite Territory, or sphere of influence; each cock probably returns to the place where he was hatched and reared, and this inevitably gives rise to disputes. From Mr. Howard's observations it is quite clear that this "Territorial System" is here, as in many other birds, of the greatest importance in the affairs of the species, and if trespassing takes place, violent conflicts ensue until one bird is in undisputed possession, which fact he proclaims by his song. Then the females arrive; they too presumably re-traverse the routes they followed southwards in the previous autumn, they hear the songs of their mates, and come down to the nesting-sites thus already staked out for them. It would appear that, while the cocks fight for the occupation of a territory, the hens fight too — for the right of entry into the territory once it has been gained by the cock. In these female combats the cock seems to take very little active interest, so that pairing-up is apparently scarcely influenced at all by individual likes or dislikes (a primitive condition, and very unlike what occurs in the Grebe) — there is simply an impulse to sing and so to attract mates in the male, in the female an impulse to pair-up with any male in possession of territory. It is only after this that "courtship" begins. Nest-building, coition, and courtship all start almost immediately after pairing-up. The courtship has the form of a display by the cock, who hops about in front of the female in the display-position found in so many birds, with head low and outstretched wings drooped and extended, tail fanned and raised; often too he holds a leaf or twig in his beak.

The female will often remain absolutely unmoved by these displays, feeding as unconcernedly as if the cock and his frantic ecstacy were a hundred miles away; but when coition takes place it seems to do so as a result of the hen being first in a receptive condition, and then being stimulated by this display of the cock.¹

¹ Critics of such a view as that here adopted to explain the habits of the Warbler, and adopted in general by Pycraft ('13), would do well to remember that in all the higher animals the *condition of the brain* very largely determines action. The cock is more eager than the hen. Her mere presence will inspire him with the desire to pair, but only at intervals; when this desire is present, he expresses it in the display actions. These actions in their turn inspire the hen with the desire to pair — but again not every time that they are exhibited.

Display and coition go on until all the eggs are laid, and incubation then begins. This is usually a duty of the hen bird, and the cock generally continues singing till the young are hatched. As far as the race is concerned, the cock's song is to attract a mate and then probably help stimulate her; but as far as the cock bird himself is concerned, song is simply an outlet, and a pleasurable one, for nervous energy; thus, provided certain internal physiological conditions are fulfilled, he will continue to sing in all moments of excitement or exaltation, non-sexual as well as sexual.¹ After hatching-time however, it is necessary that he help feed the young, and his nervous energy being thus diverted, his song ceases.

In these birds, it appears to me that we are being shown some of the primitive things of courtship. In this, Mr. Pycraft and myself are, I think, agreed; to both of us the "display" of the male Warbler is nothing but a *direct* expression of sexual excitement, scarcely, if at all, modified by Darwinian Sexual Selection — nothing but the way in which nervous disturbance caused by sexual excitement happens to liberate itself. General nervous discharge will cause general muscular contraction; and something approaching this is here seen — rapid hopping, extension and fluttering of the wings, spreading of the tail, bristling up of the feathers on head and throat, and the utterance of a series of quick sounds. This expresses a condition of readiness to pair, and doubtless to the female comes to be a symbol of the act of pairing. Hence, as far as the female is concerned, the act of pairing has come to depend upon this stimulus (acting of course on a suitable internal physiological state). This is no more strange in the bird than it is that in ourselves thoughts and emotions of love well up at the sight of some tangible object connected with the beloved. The main difference between the Grebe and the Warblers in this respect is that in the Grebe both sexes are equal in their affection and also in their eagerness, while in the Warblers the hen, as evidenced by her behavior, is most obviously less eager than the cock.

An extremely similar form of courtship, especially as far as the

¹ As is well known, many birds sing under the influence of anger (*e. g.* the Reed-warbler, *Acrocephalus streperus*), or as a result of a sense of general well-being (*e. g.* Song-thrushes, *Turdus musicus*), on warm days in winter.

relations of display and coition are concerned, is found in such birds as most Finches. These are monogamous, and the male only goes through a display. But here there is almost always sexual dimorphism, the cocks often being very brilliant, and the brilliant colors are so arranged that they are especially well shown during display. Here then some agency must have been at work, adding to the primitive display of the Warblers, and making it more effective as a stimulus to the hen.

These three different courtships give us, as I believe, the key to the general problem of courtship in birds. To me, that key consists in this: — that under the one term "Courtship" are included two entirely different sets of activities. In the first place, there are such activities as are shared equally by the two sexes — ceremonies and actions, often elaborate, performed for the pleasure and the joy of the performance; and secondly, there are ceremonies of the nature of a display by one sex only. I would prefer not to have to give special names to these two distinct sets of activities until I have more facts and more fully-digested facts; but to distinguish between them, I propose here to give the name of *Display Courtship* or *Darwinian Courtship* to the second set of activities; and to the first, which has scarcely received any of the attention it deserves, either from Darwin or subsequent authors, I shall give the name of *Mutual Courtship*.

As far as I can see, the underlying physiological bases for these two forms of courtship are to be found in the inherited sexual temperaments, if one may so call them, of the two sexes. In some birds, the male is much more eager than the female, and it is in these that Display Courtship has developed. The basis for Mutual Courtship lies in a similarity of sexual temperament in both sexes — neither markedly more eager nor more reserved than the other.

Furthermore, the immediate function of courtship is twofold. Either form of courtship may have both functions; it may serve, first, as a stimulus to coition (in Mutual Courtship the pair is worked up, in Display Courtship the male works the female up to the necessary point of exaltation); and secondly it may serve as a bond to keep the pair together.

In mutual courtships, the tendency is to drop the first function

(as in the Grebe); in Display Courtships, to drop the second (as in the Warblers). As a special development of the Display Courtships we get courtships like those of the Blackcock.

It is interesting to note the relation of Darwinian Sexual Selection to these various categories.

Darwinian Sexual Selection obviously does not operate in primitive display courtships like that of the Warblers, nor in Mutual Courtships. On the other hand, Selous' work shows that it does operate, with almost diagrammatic clearness, in the Blackcock. In the case of monogamous birds in which the males only have brilliant colors, I should like to reserve judgment. But there is another point; all courtship, it is here maintained (as also by E. Howard and by Pycraft) has had its origin in posturings and actions that are merely the direct outcome of sexual excitement, so that one finds birds without any special sexual structures or colors going through actions that are of the nature of courtship, be it mutual or be it Darwinian (take as example the Gulls on one side and the Sylviidae on the other). Then it is clear that the development of special colors and structures employed in courtship must be a later addition, due to some separate influence, and this holds true both of structures (like the Grebe's crest) used in mutual courtship, or those (like the crest of the Ruby-crowned Kinglet) used in display courtship. These latter, as I say, may perhaps owe their origin to Darwinian Sexual Selection. The former cannot, so we must revise our theories in the light of this new conception of Mutual Courtship.

Mr. Selous has a very interesting chapter on this subject. (Selous, '05. "Inter-sexual Selection," pp. 261-283), to which, however, my attention has only just been drawn. My own conclusions, though similar in many ways, were reached entirely independently (Huxley, '14, pp. 523-525).

It is necessary to observe that in most birds, as in Man himself, the two forms of Courtship are inextricably interwoven. Man is one of the most complicated of all, for while much is absolutely reciprocal, yet there is much that is not mutual, and it is almost impossible not to believe that here at least there has been a double action of Darwinian Selection, the ancestral appearance of both man and woman having been modified in different ways through its agency.

The facts given above and their discussion will serve to make clear some of the general principles and problems of courtship in birds. Our next business is to get an insight into the interpretation of observations on birds. The connected descriptions I have given of the life-histories of various birds have only been made possible, first by the collection of a great many facts, and secondly by the interpretation of those facts; and the second is as important as the first.

It is indeed almost impossible to collect valuable facts unless one has some idea of how they are to be interpreted, and to those who are interested in this subject, I would say this: — remember the multifarious aspects from which any fact of bird-behavior can and should be looked at.

Take the case of any elaborate courtship action, such as the 'shaking' of the Grebe, or the dance of the Blackcock. There are two main points we want to understand; what is the meaning to-day? and what has been the origin in the past? And to answer these we have first to ask, and answer, the following questions: —

First, can we see any utility in it? if so, is it of use (a) simply to the species as a species, or is it of use (b) to the individual, (c) the pair, or (d) the family, and so indirectly to the species?

Secondly, can we see anything which is not of definite biological utility in the character? if so, what is the reason for the presence of this non-utilitarian factor? Is it (a) purely accidental? (b) determined through the inheritance of characters once useful, but now no longer so? (c) a matter of physiological correlation — that is to say, dependent on the general structure and working of the rest of the body? (d) dependent on the structure and working of the mind — a matter of psychological correlation?

Let us analyse the above examples in the light of these questions. The mutual head-shaking of the Grebe is apparently of use, like all the other mutual courtship actions, in keeping the pair together during the breeding season. It is then of direct biological use to the pair regarded as a unit of the race, and to the next generation. Besides this, it may be of some slight advantage to the individuals as liberating the energy of the sexual period in a harmless and pleasurable manner; but as far as origin is concerned, the survival value of the character — the handle by which Mutual Selection

can seize hold of it — is given entirely by its value to the pair and to the offspring.

On the other hand, many of the details of the ruff itself, and of the mode of shaking, are non-utilitarian. To carry out its function successfully, any courtship-action must stimulate the senses in a way which must be either pleasurable or startling, or a combination of both, and to this condition the erected ruff of the Grebe conforms — it affords a brilliant combination of black, chestnut and white, which, in addition, is only revealed when the ruff is erected. The general principles of the action are thus determined; but the origin of many of the details we can only look upon as accidental. As far as the position and color of the ornament is concerned we can only say that the Grebe family "shows a tendency" to develop crests and ruffs on the head, and that any brilliant pigmentation they possess runs to black, warm browns, yellows, and whites, while that of other birds runs to other colors — in the Woodpeckers to scarlet, in the Parrots largely to greens and yellows, and so forth. These things are "accidents," in the sense that they are determined by unknown peculiarities in the constitution of the species.

The *form of the action* itself, however, is largely a matter of correlation. Many water-birds can be seen to shake their heads from side to side at intervals, especially after preening themselves, and from observations on the curious connection between this courtship-action and actual preening in the Grebe, I have no doubt that it is a specialization of the casual head-shaking after preening.¹

Finally there is a modification of the typical action of shaking which is seen under the influence of jealousy, and is characterized by exaggeration of all the normal behavior (Huxley, '14, p. 511). This is a matter of psychological correlation — take a Sensorimotor arc connected with mental processes; increase the intensity of the mental processes, and you increase the intensity of the actions which are the end, *i. e.* result of that activity.

To get an example of an action which is determined through inheritance alone, we must go to another species. The Ringed

¹ Huxley, '14, p. 515. In a similar way the elaborate courtship ceremonies, as seen in the Grebe and many other species, in which twigs are used and held in the bill, doubtless take their *origin* in nest-building.

Plover, for instance, (*Ægialitis hiaticula*) usually breeds on the seashore, and there lays its eggs among the stones. A certain number, however, breed on inland heaths, but even these pave their nests with small stones (Newton, '93, p. 482).

Such a discussion will make it easier to comprehend that it is possible to answer in various ways that question "why does such-and-such a species of bird perform such-and-such an action?" "Why do the Grebes shake their heads at each other?" The Evolutionist answers that the cause lies in Mutual Selection, which has developed the action for the good of the race. The Physiologist sees the reason in the activity of the gonads; these exert by chemical means a stimulus on the nervous system, which in its turn is arranged in such a way as to cause the stimulus to run down and set the appropriate muscles to working. The Psychologist sees in it a self-exhausting psychological process accompanied by a pleasurable expression of emotion — the bird does it because it enjoys doing it. In reality, all are right — in their degree; and it is from a failure to get a sufficiently broad point of view, a failure to distinguish between ultimate cause, immediate cause, and mere necessary machinery, that so much of the barren disputes of biology are due.

(To be concluded.)

LABRADOR BIRD NOTES.

BY WELLS W. COOKE.

MORE than a century ago Cartwright lived at Sandwich Bay on the eastern coast of Labrador and left a journal which contains many notes on the arrival and departure of the birds. Scarcely any migration notes on the birds of this district have been published during all these subsequent years. The coast has been visited by various ornithologists — Coues, Turner, Stearns, Bigelow, Townsend, and Allen — but these men arrived there in the early summer after the close of spring migration and left too early in the fall to note more than the beginning of the return movement. Hence while the birds have been studied during the breeding season, but scant records have been made of their arrival and departure.

In the fall of 1912 Mr. Clarence Birdseye, of New York City, went to Labrador as resident manager for a fox farming company. The winter of 1912-13 was spent at Battle Harbor. The following summer a permanent site for the fox farm was selected near Sandwich Bay, and the two following winters were spent at this place. During each winter long trips were made by dog sledge up and down the coast, and each summer he was absent for a few weeks while making a trip to New York City. Several years of field work for the U. S. Biological Survey had given Mr. Birdseye an excellent training for accurate observation, and during his residence in Labrador he has made copious notes on the bird life. He has turned over all these notes to me with a request that I publish the more interesting records. It must be understood, however, that watching the birds was a mere incident in a life filled full with exacting duties in other lines and that, therefore, the bird notes are not so numerous as his inclinations would have prompted.

The additions to the list of the birds of eastern Labrador are: *Chen hyperboreus hyperboreus*, *Zenaidura macroura carolinensis*, *Mniotilta varia*, and *Dendroica virens*, while the second records on this coast were obtained for *Marila marila*, *Branta bernicla leucogastra*, *Dendroica æstiva æstiva*, and *Regulus calendula calendula*.

Only two previous records had been published for *Fulica americana* and *Colaptes auratus luteus*. The known range of *Cyanocitta cristata cristata* on the south coast has been extended a long distance eastward.

The fox farm is at Dykes Bay, near the entrance to Sandwich Bay, about four miles southwest of Cartwright, about 150 miles north of the eastern end of the Strait of Belle Isle, and about 70 miles southeast of Rigolet, near which place Dr. Coues made many of his Labrador observations. The Sandwich Bay records refer to the fox farm. The settlement called Paradise where Cartwright spent much of his time, and which was often visited by Birdseye, is at the southwestern corner of Sandwich Bay, some fifteen miles from the fox farm. Battle Harbor is on St. Lewis Sound about 40 miles north of the Strait of Belle Isle. Flowers Cove, Newfoundland, and Forteau, Labrador, are at the west end of the Strait of Belle Isle; West Ste. Modiste and Red Bay are in the middle of the Strait; Chateau Bay and Pleasure Harbor are just north of its eastern end; Caribou Island and Lewis Bay are near Battle; Hawke Harbor is 50 miles north of Battle; Seal Islands and Spotted Islands are 50 miles east of Cartwright and Table Bay half that distance; Woody Point and West Bay are on the coast between Cartwright and the mouth of Hamilton Inlet, while Ticoralak is on the north shore of Hamilton Inlet near Rigolet.

1. **Gavia immer.** LOON.—Battle Harbor, May 15, 1913; Ticoralak, October 12, 1912.
2. **Cephus grylle** or **mandti.** GUILLEMOT.—Several at Woody Point, December 30, 1912, and at Lewis Bay, February 15, 1913.
3. **Larus marinus.** GREAT BLACK-BACKED GULL.—Unusually early arrivals were seen near Romaine, March 26, 1914, and at Rigolet April 9, 1915. The species was still present on the Seal Islands November 2, 1912.
4. **Larus argentatus.** HERRING GULL.—The last at Battle Harbor was noted October 22, 1912.
5. **Puffinus gravis.** GREATER SHEARWATER.—Seen at Hawke Harbor, August 19, 1912.
6. **Mergus serrator.** RED-BREASTED MERGANSER.—Arrived at Cartwright, May 2, 1915, which is probably about an average date.
7. **Anas rubripes.** BLACK DUCK.—First seen at Caribou Island, May 1, 1913, and at Sandwich Bay, May 2, 1915.
8. **Nettion carolinense.** GREEN-WINGED TEAL.—This is a rare species on the Labrador coast, but the wing of one was seen which had been shot near Ticoralak.

9. **Marila marila.** SCAUP DUCK.—Two young males were shot at Tioralak, October 11, 1912. The only other record for the whole coast of Labrador is that of one shot near Nain in October, 1899.

10. **Harelda hyemalis.** OLD-SQUAW.—The first fall migrant appeared at Pleasure Harbor, September 16, 1912.

11. **Somateria mollissima borealis.** NORTHERN EIDER.—The breeding eider of this part of the coast of eastern Labrador is *dresseri*, but the winter birds are undoubtedly the northern species since Battle Harbor is at the extreme northern limit of the breeding range of *dresseri*. In the fall of 1912 the Eider Duck shooting began near Battle Harbor on September 20, but at that time the birds were scarce and only a few were obtained. Even a month later, October 24, the gunning season had not yet reached its height, and seven men in one day killed only about 80 birds. Later the numbers increased and the birds remained as long as they could find any open water. At West Bay on January 31, 1913, after the simultaneous discharge of six guns, 140 eiders were picked up and many more were lost. A flock of not less than 400 was seen at Rigolet March 14, 1913. The first northward migrants were noted at Battle Harbor, May 1, 1913, and on May 23, they passed by the thousand in companies of a hundred or more.

12. **Chen hyperboreus hyperboreus.** LESSER SNOW GOOSE.—Snow Geese are only stragglers on the Labrador coast; indeed a single doubtful record at Okkak is the only one for the whole coast. One was shot at Independent Harbor about October 1, 1914, where none of the inhabitants could remember seeing a white goose. Its skin is now in the U. S. Biological Survey collection and, strangely enough, it turns out to be the small form from western North America.

13. **Branta canadensis canadensis.** CANADA GOOSE.—The first were noted at Battle Harbor, May 1, 1913, and at Sandwich Bay, April 30, 1915. These dates agree closely with those given by Cartwright, who records the first as arriving near this same locality on May 4, 1775, April 30, 1776, May 1, 1779, and May 8, 1786.

14. **Branta bernicla glaucogastra.** BRANT.—There is no certain record of a Brant anywhere on the Labrador coast, except the one shot at Nain in October, 1899. One is reported to have been taken at Tioralak the fall of 1912 and the record is probably correct.

15. **Botaurus lentiginosus.** BITTERN.—This species is known from Cape St. Francis only a few miles to the south of Sandwich Bay, and hence the report that it breeds near this latter place is probably correct.

16. **Fulica americana.** COOT.—One was shot at Table Bay in October, 1913, and is now in the collection of the Biological Survey. The only other records for the whole east coast of Labrador are of one taken near Nain in 1880 and one at Sandwich Bay in August, 1899.

17. **Phalaropus fulicarius.** RED PHALAROPE.—A late record for the coast of Labrador is that of several Red Phalaropes seen at West Ste. Modiste, September 13, 1912.

18. **Gallinago delicata.** WILSON'S SNIBE.—It may be well to record

two Wilson's Snipe seen at Flowers Cove, Newfoundland, September 10, 1912, for this is near the northern limit of the range of the species.

19. ***Pisobia maculata***. PECTORAL SANDPIPER.—Those individuals that were still present at Ticoralak October 12, 1912, were remaining later than usual.

20. ***Pisobia fuscicollis***. WHITE-RUMPED SANDPIPER.—This species remained still later than *P. maculata*, for single birds were seen at Battle Harbor to October 29, 1912, while in August they were abundant in flocks of hundreds.

21. ***Pisobia minutilla***. LEAST SANDPIPER.—This species migrates so late that the first was not seen at Battle Harbor until June 1, 1913. Migrants returned to Battle Harbor August 7, 1912, and remained for about three weeks.

22. ***Totanus melanoleucus***. GREATER YELLOW-LEGS.—The first were seen at Battle Harbor May 14, 1913, and at Sandwich Bay June 4, 1915. These places are near the normal northern range of the species. Several were noted September 15, 1912, at Chateau Bay and the last were seen October 12, 1912, at Ticoralak.

23. ***Numenius borealis***. ESKIMO CURLEW.—Though this species may become extinct in the near future, it still existed in 1912, and during that year a few were seen August 17 on Caribou Island; one was recorded at Cartwright in September and four at West Bay during the same month.

24. ***Zenaidura macroura carolinensis***. MOURNING DOVE.—The most northern previous record on the Labrador coast for the Mourning Dove is at Red Bay in the Straits of Belle Isle. The known range can now be extended to Battle Harbor where one was seen October 20, 1912, and one found dead on the beach at Spotted Islands during August of the same year. One was shot near Battle Harbor in September, 1912. A close observer of bird life who has lived at Sandwich Bay for fifty years says that during all that time he has seen Mourning Doves only twice, once in 1909 and once the following year.

25. ***Pandion haliaëtus carolinensis***. OSPREY.—To the very few records of this species on the eastern coast of Labrador may be added that a pair was seen at Sandwich Bay May 28, 1915, and again the next day. The species breeds on both North River and White Bear River which flow into Sandwich Bay.

26. ***Nyctea nyctea***. SNOWY OWL.—“Many of the people at Sandwich Bay set steel traps on isolated stumps for owls. These birds are usually very fat and are good eating. The fat is not at all strong” (Birdseye).

27. ***Colaptes auratus luteus***. NORTHERN FLICKER.—This species is probably not so rare as its few records for the eastern coast of Labrador would indicate. One was taken at Sandwich Bay in August, 1908, and one at Okpatok Island, Hudson Strait, October, 1882. These are the only published records for eastern Labrador, but a man who lived at Sandwich Bay and had taken a specimen there the spring of 1909 said that they nested in that neighborhood. In confirmation of this two individuals were heard there June 5, 1915.

28. **Otocoris alpestris alpestris.** HORNED LARK.—The last one noted in 1912 was at Ticoralak October 12, and the first returning migrant was seen at Sandwich Bay, April 22, 1913.

29. **Cyanocitta cristata cristata.** BLUE JAY.—The known range of this species was decidedly extended by the capture of a specimen in 1912 at Harrington on the south coast of Labrador near Romaine. It had not been previously recorded east of Mingan.

30. **Euphagus carolinus.** RUSTY BLACKBIRD.—The last one seen in 1912 at Flowers Cove, Newfoundland, was seen on September 10. It is there a common breeder.

31. **Plectrophenax nivalis nivalis.** SNOW BUNTING.—This species is an abundant migrant at Battle Harbor, but does not breed there and is rare through the winter. During the spring migration great numbers are killed for food, as many as twenty being taken at a single shot. After November 6, 1912, the only ones seen were one on December 29, 1912, and one on February 15, 1913. The first song was heard May 1, 1913, when the species was abundant, but most left the latter part of that month, the last seen being three on May 31, and one the next day.

32. **Calcarius lapponicus lapponicus.** LAPLAND LONGSPUR.—Neither breeding nor wintering at Battle Harbor, the first spring arrival of the Lapland Longspur was noted there May 13, 1913.

33. **Passerherbulus sandwichensis savanna.** SAVANNAH SPARROW.—The last record made of a Savannah Sparrow at Battle Harbor was on September 12, 1912, when the species was still common. The first arrived the next spring on May 15.

34. **Zonotrichia leucophrys leucophrys.** WHITE-CROWNED SPARROW.—An abundant breeder on the Labrador coast. The last was seen at Forteau September 11, 1912, and the first at Battle Harbor May 22, 1913, and at Sandwich Bay May 28, 1915.

35. **Zonotrichia albicollis.** WHITE-THROATED SPARROW.—There seems to be no published record of the occurrence of the White-throated Sparrow on the Labrador coast north of Battle Harbor. It is rare there, and the first arrived May 19, 1913, and several were heard May 22. The last was heard in 1912 at Forteau on September 11.

36. **Spizella monticola monticola.** TREE SPARROW.—This species was abundant in migration at Forteau, September 11, 1912. It seldom nests on the coast, but is a common breeder in the wooded country inland, nesting for the most part on the ground and occasionally in the trees. The first arrived at Battle Harbor in 1913 on May 15.

37. **Junco hyemalis hyemalis.** SLATE-COLORED JUNCO.—Labrador is much too cold for the Junco or "snowbird" to winter and in the Sandwich Bay district it is not common at any time. One was seen at Lewis Bay August 13, 1912, and one at Rigolet September 30, 1912. The following spring a single bird appeared at Battle Harbor on the unusual date of April 16, and a few were seen for ten days; then they disappeared and were not noted again until their usual time of arrival the middle of May. In 1915 the first appeared at Sandwich Bay on May 12.

38. *Melospiza lincolni*. LINCOLN'S SPARROW.— The last one seen at Forteau in 1912 was on September 11.

39. *Passerella iliaca iliaca*. FOX SPARROW.— The last were seen at the head of Chateau Bay September 15, 1912, and on the coast of Newfoundland, near Flowers Cove, September 10, 1913. The first was heard on Sandwich Bay, May 5, 1915.

40. *Mniotilta varia*. BLACK AND WHITE WARBLER.— The first record for Labrador is that of one seen at Sandwich Bay June 2-4, 1915. It was undoubtedly a straggler for the species had not previously been known northeast of Anticosti Island.

41. *Dendroica aestiva aestiva*. YELLOW WARBLER.— The only previous record of a Yellow Warbler on the eastern coast of Labrador seems to be that of the one taken on Hamilton Inlet, September 1, 1905. To this record can now be added that of a pair seen at Sandwich Bay June 6, 1915.

42. *Dendroica coronata*. MYRTLE WARBLER.— The earliest warblers to appear at Sandwich Bay the spring of 1915 were about a dozen Myrtle Warblers that arrived May 24.

43. *Dendroica striata*. BLACK-POLL WARBLER.— The first were noted at Battle Harbor, June 6, 1913, and at Sandwich Bay May 27, 1915. This is a good example of the fact that a late migrant advances on the average more miles per day than an early migrant. The Black-poll Warbler arrived at Sandwich Bay in 1915 only three days later than the Myrtle Warbler, though it arrives at Washington, D. C., on the average more than thirty days behind the latter. It is also interesting to note in this connection that, assuming May 5 as the average date of arrival at Washington, the Black-poll Warbler occupies about twenty-five days in passing over the fifteen hundred miles thence to the Labrador coast, an average of about sixty miles a day, while the Black-poll Warblers that are to nest in Alaska are averaging more than a hundred and fifty miles a day during this same part of May and by the end of the month reach Kotzebue Sound a thousand miles farther north than Sandwich.

44. *Dendroica virens*. BLACK-THROATED GREEN WARBLER.— The list of the known birds of the east coast of Labrador has been increased by the addition of the Black-throated Green Warbler, a specimen of which was seen at Battle Harbor June 6, 1913. The most eastern previous record was that of one at Eskimo Point.

45. *Anthus rubescens*. PIPIT.— The last was seen at Ticoralak in 1912 on October 11, and the first arrival the following spring at Battle Harbor on May 16.

46. *Regulus calendula calendula*. RUBY-CROWNED KINGLET.— One was seen at Sandwich Bay May 26, 1915. There seems to be only one previous record of the species on the coast of eastern Labrador and that was at Rigolet on August 6, 1860.

47. *Planesticus migratorius migratorius*. ROBIN.— The last was seen at Forteau September 11, 1912, and the first at Sandwich Bay May 1, 1915.

FIVE YEARS PERSONAL NOTES AND OBSERVATIONS
ON THE BIRDS OF HATLEY, STANSTEAD COUNTY,
QUEBEC — 1911-1915.

BY H. MOUSLEY.

(Concluded from p. 73.)

53. **Dolichonyx oryzivorus** (Linnæus). BOBOLINK.— Abundant summer visitant; May 9 to Aug. 16. Average date of arrival (for five years) May 13; of departure (for three years) Aug. 14. Eggs: June 6 to 16. The Bobolink here seems to be increasing in numbers as during the past two summers, I have found it nesting not only in its former haunts, but in many other places where I had not noticed it previously. The males usually arrive about a fortnight in advance of the females, the exact dates this year (1915) being, males May 11, and females May 25.

54. **Molothrus ater ater** (Boddært). COWBIRD.— Rare summer visitant; April 16 to June 30. Eggs: June 27. It is with feelings of regret that I have now to include the Cowbird as a summer visitant, after four years of its inclusion as a transient only, as previous to the present summer, 1915, I had only seen four examples of the bird in April, 1913. This summer however, two pairs could generally be seen in the neighbourhood from April 24 to the end of June, with the result that at least one Yellow Warbler and Red-eyed Vireo were victimized, an egg being found in the nest of the former and a young bird in that of the latter. Mr. L. M. Terrill's experience at Bury about 35 miles northeast of Hatley, somewhat coincides with mine, as writing in the 'Ottawa Naturalist' November, 1904, he says: "I did not find any Warbler's nests containing eggs of the Cowbird, in fact the only individual intruded on was a Bluebird." In my limited experience of the bird I have found the females to arrive with the males.

55. **Agelaius phoeniceus phoeniceus** (Linnæus). RED-WINGED BLACKBIRD.— Abundant summer visitant; April 6 to Aug. 17 (Sept. 24, Oct. 21, Nov. 1). Average date of arrival (for five years) April 8; of departure (for three years) Aug. 15. Eggs: May 13 to June 15. During the spring and summer of 1912 this bird, always a plentiful one, fairly swarmed and nested in many new localities which have not been tenanted since. The favourite situation here for nests is low down in the large cat-tail beds, only on three occasions have I found them in small bushes. By the middle of August all the birds have generally disappeared, the late dates in September, October and November being for two to four birds only on each occasion, which dropped into the cat-tail beds in the marsh late in the evening. The males usually precede the females by several

weeks, the exact period in 1915 being one month, males March 25, females April 25. Four eggs in a set seem to be the usual number; only on two occasions have I found five, and these out of fifty-seven nests examined.

56. *Sturnella magna magna* (Linnæus). MEADOWLARK.—Rare summer visitant; April 11 to Oct. 25. I have only seen fifteen examples of this bird altogether, and these, with the exception of two, were some miles away from my house, two in June of 1913 near Massawippi, which were evidently breeding, one having building material in its beak, nine at Compton in October of the same year, one again at Massawippi in May, 1914, and one in June, 1915, near Coaticook. The remaining two were seen close to my house, one in April and the other in May.

57. *Icterus galbula* (Linnæus). BALTIMORE ORIOLE.—Fairly common summer visitant; May 11 to Aug. 25. Average date of arrival (for five years) May 14; of departure (for three years) Aug. 22. Eggs:—June 8. The usual nesting site selected here is near the top of some fair sized tree, generally a maple. The nests vary somewhat in depth, which in some cases may be as much as six inches, whilst one built in a maple opposite my house only measures three and one half inches. After the young leave the nest, all the Orioles seem to disappear, and are not seen again until towards the beginning or middle of August on their way south for the winter. The males generally precede the females by some few days, the exact time in 1915 being a week, males May 16 and females May 23.

58. *Euphagus carolinus* (Müller). RUSTY BLACKBIRD.—Rare transient; Oct. 1 to 27. The only example I had seen of this bird (previous to the present year, 1915) was that of an immature shot on the morning of October 21, 1914, and shown to me in the flesh the same evening. This year however, a flock of 25 visited the marsh on October 1 and remained in the neighbourhood for some weeks.

59. *Quiscalus quiscula æneus* (Ridgway). BRONZED GRACKLE.—Common summer visitant; April 14 to Oct. 20. Average date of arrival (for five years) April 16; of departure (for four years) Oct. 10. Eggs: May 29. The Bronzed Grackle is not nearly as plentiful here as the Red-winged Blackbird. At one time a few of them used to nest in hollow stumps in the marsh but lately all seem to have taken a liking for evergreen trees, more particularly fir and pine, in which they construct their somewhat bulky nests. They are interesting birds, showing great development along many lines, but their egg robbing proclivities makes it undesirable to have many of them about. Speaking from memory only, I fancy I have always noticed the males and females arriving together like the Cowbird.

60. *Hesperiphona vespertina vespertina* (W. Cooper). EVENING GROSBEAK.—Occasional but rare winter visitant; Feb. 12. The above date in 1913 is the first on which I had the pleasure of seeing a small flock of nine of these rare birds at close quarters, as they were feeding on the buds of the row of maple trees that runs through the centre of the village of Hatley. The weather at the time was very cold, the thermometer registering 2° below zero. On the following day a male was observed amongst a

flock of Pine Grosbeaks about a mile and a half south of the village, but although a careful lookout was kept for some weeks, this was the only other occasion on which any were seen.

61. **Pinicola enucleator leucura** (Müller). PINE GROSBK.—Irregular winter visitant; Jan. 23 to March 28. My first acquaintance with these interesting birds was made on February 8, 1912, when small flocks visited the apple and maple trees round my house, feeding on the old apples still remaining on the former and doing considerable damage to the buds of the latter, before they left on March 28. The following winter they arrived on Jan. 23 and it was not until March 21, that I saw the last of them. Most of the flocks consisted of females and young birds with only a few red ones amongst them as a rule.

62. **Passer domesticus domesticus** (Linnaeus). HOUSE SPARROW.—Common resident. Eggs: May to July. This great pest luckily is not very abundant here so far, many of the farms having none at all, and at those where they have taken up their abode they do not seem to increase in numbers very materially, nor do the villages seem to be particularly overburdened with them.

63. **Carpodacus purpureus purpureus** (Gmelin). PURPLE FINCH.—Fairly common summer visitant; May 2 to Oct. 25 (Nov. 28). Average date of arrival (for four years) May 10; of departure (for three years) Oct. 17. This is quite a common bird at migration times, but during the summer months its numbers are very limited, and I have not yet been able to locate a nest, although two or three old ones found in the fall would seem to belong to this species judging from their situation and construction. The late date in November is for a single female only, which was in the company of a large flock of Goldfinches.

64. **Acanthis linaria linaria** (Linnaeus). REDPOLL.—Irregular winter visitant; Nov. 30 to April 13. So far as I have been able to judge the Redpoll is decidedly an irregular and erratic visitor, and the largest flock that I have come across consisted of only forty birds.

65. **Astragalinus tristis tristis** (Linnaeus). GOLDFINCH.—Common summer visitant, sometimes in winter; May 3 to Nov. 28 (Dec. 18, 31, Jan. 4). Average date of arrival (for four years) May 15; of departure (for two years) Nov. 28. Eggs: June 3 to Aug. 20. Notwithstanding careful searching I have not observed the Goldfinch during the winter and early spring months, until the present year 1915, when a pair of birds were seen on each of the dates in December, and five on Jan. 4, 1916. The very early and hot summer of 1911 was no doubt responsible for the unusually early date of June 3 for a set of eggs. Out of ten nests examined two contained a set of six eggs.

66. **Spinus pinus** (Wilson). PINE SISKIN.—Irregular winter visitant; Nov. 7 to May 25. My first acquaintance with the Pine Siskin was in December of 1914, and from then on to May 25, 1915, I encountered them almost daily in flocks of from 5 to 25 birds. They were especially fond of a little swampy cedar wood upon the seeds of which they could be

found feeding almost any day. From the actions of a few scattered pairs I felt sure they were breeding, but it was not until May 12 that I had the satisfaction of twice seeing an adult bird feeding a fully grown young, and on September 18 on the outskirts of a large wood (at a spot where I well remember having seen a pair of birds on two or three occasions early in April), I found what I feel sure was a nest of this species. It was situated 25 feet up in a tall fir tree well concealed and saddled on to a branch at its junction with the main trunk, and is different from any other nest I have ever found here before. The foundation consisted of a platform of small fir twigs and a few grass stems $5\frac{1}{2}$ inches in width, upon which rested the nest proper. This was composed of very fine strips of bark and grasses, warmly lined with animal fur, thistledown and some horse hair, the whole structure looking remarkably large and flat for such a small bird. The other measurements as near as I could get at them, seeing that the nest had been occupied, and was some few months old, are as follows, viz: outside diameter $3\frac{3}{4}$, inside 2 inches, outside depth $1\frac{1}{4}$, inside $\frac{1}{4}$ of an inch. A good deal of the young birds' droppings still remained attached to the fir twig foundation. No doubt the eggs had been laid very early in April.

67. **Plectrophenax nivalis nivalis** (Linnaeus). SNOW BUNTING.—Irregular winter visitant; Oct. 28 to March 18. Most of the flocks so far observed of this interesting Bunting have been small ones, consisting of from eight to twenty birds, the only exception being on Jan. 2, 1913, when one which must have numbered well over a thousand birds paid us a visit and remained in the neighbourhood for the best part of the day.

68. **Poecetes gramineus gramineus** (Gmelin). VESPER SPARROW.—Common summer visitant; April 16 to Oct. 12. Average date of arrival (for four years) April 22; of departure (for four years) Sept. 25. Eggs: May 20 to July 15. This sparrow can generally be found nesting in most of the fields, but more especially those that are sparsely covered with grass and weeds. It is not a very abundant breeding species at any time, and during the present season (1915) has really been scarce, only one nest having been located. It is the only sparrow of which I have not yet found a set of 5 eggs, as out of 17 nests examined nearly all contained four eggs, which would appear to be the usual number for this district. At migration times in common with most of the other sparrows it is seen in greatly increased numbers.

69. **Passerculus sandwichensis savanna** (Wilson). SAVANNAH SPARROW.—Fairly common summer visitant; April 16 to Oct. 12. Average date of arrival (for four years) April 25; of departure (for four years) Oct. 7. Eggs; May 24 to July 14. This is the rarest of the breeding sparrows here, only a few pairs nesting in a very restricted area, in fact two fields overlooking the marsh are the only ones in which I have found their nests so far. These in my experience, with one exception, are always well sunk in the ground, the rims being flush with the surface and generally long grass covers the top, which makes them very difficult to locate. Out of ten nests examined two only contained a set of five eggs, and one had

moss in its construction, a somewhat unusual material for this bird to make use of. The bird when flushed from a partly built nest or one containing one or two eggs, invariably deserts it, at least this has been my experience on several occasions.

70. *Zonotrichia leucophrys leucophrys* (J. R. Forster). WHITE CROWNED SPARROW.—Rare transient; Oct. 16. The above date in 1914, is the only one on which I have seen an example of this handsome sparrow. The bird was on a wood pile in my garden and when first noticed had the feathers on the top of the crown erected which drew my attention to it more especially, and forms a minor means of identification when one can catch the bird in the mood. However irrespective of this I had ample time to notice the other marks which separate it from the White-throated species.

71. *Zonotrichia albicollis* (Gmelin). WHITE-THROATED SPARROW.—Common summer visitant; April 23 to Oct. 25. Average date of arrival (for four years) April 29; of departure (for four years) Oct. 16. Eggs: May 25 to July 19. This most aristocratic of sparrows is by no means very plentiful, although a pair can generally be found in most suitable openings in the woods. The nest is quite distinct from that of the other sparrows breeding here, being a larger and more substantial structure, and generally in my experience having skeleton leaves as part of the foundation, and green moss in the outer rim, the latter never being absent, and forming an invariable clue to the owner.

The average dimensions of nine nests are as follows, viz.: outside diameter $4\frac{1}{2}$, inside $2\frac{1}{2}$ inches; outside depth $2\frac{3}{4}$, inside 2 inches. Out of 20 nests examined only 3 contained a set of 5 eggs, 4 being the general number. Like the Savannah it is a particularly sensitive bird and flushing it from an incompleated nest or one containing one or two eggs, generally results in its being abandoned. I have heard two of these sparrows singing as late as September 25 at six o'clock in the evening.

72. *Spizella monticola monticola* (Gmelin). TREE SPARROW.—Fairly common transient, April 22, Oct. 4 to Nov. 13. Average date of arrival (for two years) Oct. 14; of departure (for two years) Nov. 10. It was not until October 4, 1914, that I first noticed one of these little sparrows, and then no more were seen until the end of the month, when they became fairly common in the cat-tail beds in the marsh, on the heads of which they were fond of perching in contrast to the elusive ways of the Swamp and Savannah Sparrows, whose one object in life seems to be to keep out of sight. On the date in April of the present year, 1915, only two examples were seen, but during the fall migration they have been far more plentiful than last year.

73. *Spizella passerina passerina* (Bechstein). CHIPPING SPARROW.—Common summer visitant; April 20 to Oct. 12. Average date of arrival (for five years) April 24; of departure (for four years) Oct. 6. Eggs: May 22 to July 17. This small sparrow can usually be found nesting not only round every farm house, but generally all over the country side. Curiously enough the first nest I ever found contained a set of six eggs, a

very unusual number, and one I am not likely to duplicate, and this remark applies also to one of three eggs, which to all intents and purposes are all immaculate. In addition to these out of 43 nests examined I have found three sets of five, which are uncommon, four and three being the most general number and about equally divided.

74. *Junco hyemalis hyemalis* (Linnæus). SLATE-COLORED JUNCO.— Common summer visitant; abundant transient; April 1 to Nov. 13. Average date of arrival (for four years) April 6; of departure (for four years) Nov. 11. Eggs: May 20 to July 17. If only one tenth of the birds seen at the spring migration stayed behind to breed they would more than equal the Song Sparrow in abundance. As it is, only a limited number of pairs remain as a rule, but during the present season (1915) quite a change has taken place, more pairs being noted and nests located than ever before. Out of a total of 21 nests examined only three contained a set of five eggs, and all were on the ground with the exception of one which was ten inches up in a cedar bush.

75. *Melospiza melodia melodia* (Wilson). SONG SPARROW.— Abundant summer visitant; April 1 to Nov. 8. Average date of arrival (for five years) April 8; of departure (for four years) Nov. 1. Eggs: May 17 to July 29. This is certainly the most abundant sparrow here. Their nests are invariably placed on the ground in this locality, only four having been found in low bushes from two to six feet above the ground, one in May and the others in June and July, these latter evidently being second or third broods. This sparrow would appear to lay five eggs in a set more generally than four, as out of sixty-two nests examined, 32 contained sets of five as against 20 of four.

76. *Melospiza georgiana* (Latham). SWAMP SPARROW.— Fairly common summer visitant; April 9 to Oct. 25. Average date of arrival (for four years) April 20; of departure (for four years) Oct. 23. Eggs: May 23 to June 14. This sparrow although it can generally be found in a few favoured localities is not by any means very plentiful (except at the fall migration) and during 1914 was really scarce, careful searching only revealing one nest as against three or four of previous years. In the case of the Song Sparrow the number of nests containing five eggs was just over fifty per cent, with this species it is just a little under, as out of twelve nests examined five contained the full complement only.

77. *Passerella iliaca iliaca* (Merrem). FOX SPARROW.— Rare transient; Oct. 16, Nov. 5. The above dates in 1914 are the only ones on which I have observed this large and handsome sparrow, and then only one example was seen on each occasion.

78. *Zamelodia ludoviciana* (Linnæus). ROSE-BREADED GROSBEAK.— Rare summer visitant; May 24 to Sept. 2. Eggs: May 31. The Rose-breasted Grosbeak is decidedly a rare breeding bird about here, only one nest and eggs having been so far located in five years. This was a frail affair placed in a small tree about six feet above the ground at the side of a much frequented road, and contained three eggs upon which the

male was sitting. In addition to this bird, only fourteen other examples have been seen, two each in May and July, nine in August and one in September. In connection with the peculiar and interesting distribution of this bird in Maine and the suggestion of the late Mr. Ora W. Knight in his 'Birds of Maine' 1908, p. 441, that the northern representatives of the species enter the State from the west and pass across it by some regular migration route; and also the previous surmise of the late Mr. Henry A. Purdie (Amer. Naturalist, Vol. 3, 1869, p. 331) that some birds not common on the central and southern Maine coast may reach the northeastern coast of Maine by the St. Lawrence and Maine Central water route, I would here like to venture the opinion that if this is so, the birds enter Maine from the west and the St. Lawrence, by way of the river St. Francis, the following of whose course would eventually bring them in the vicinity of Lake Megantic at which place or near abouts they probably enter the State of Maine. Much further study however will be necessary before this interesting problem can be solved, but in the meantime I feel sure that apart from this theory the river St. Francis as already suggested elsewhere, does form a minor if not a principal highway of migration for birds passing through Hatley.

79. *Passerina cyanea* (Linnaeus). INDIGO BUNTING. — Rare summer visitant; June 22 to June 27. Eggs: June 27. This is another rare breeding bird, only a pair having been seen and their nest located in five years. This was placed in a small shrub about four feet above the ground at the side of a little frequented road, and contained the remarkably small set of two eggs only. I found the nest soon after it was commenced and had it under observation every day, not taking the eggs until incubation had been advanced a few days. It was not until the nest was completed on June 22 that I became aware of the owners, never having been able to catch either of them near the site when I had visited it previously. The female was very secretive in her manner never rising above the underbrush. If it had not been for the location I could almost have assigned the nest in the first instance, as belonging to an Alder Flycatcher; which in outward appearance it greatly resembled.

80. *Piranga erythromelas* (Vieillot). SCARLET TANAGER. — Rare transient; May 15 to June 1. I have only seen four examples of this handsome bird in five years, a male and female in June, 1912, and two males in May of the present year, 1915.

81. *Petrochelidon lunifrons lunifrons* (Say). CLIFF SWALLOW. — Common summer visitant; May 6 to Sept. 1. Average date of arrival (for four years) May 12; of departure (for three years) Aug. 29. Eggs: June 2 to 21. The Cliff Swallow is plentiful at all times especially during the fall migration. As a summer resident it probably comes next to the Barn Swallow as regards numbers, and its gourd shaped nests can be found crowded together under the eaves of large barns or warehouses. One nest I found had two entrance holes, one on each side, the neck in each case being very flat and short, thus leaving a clear passage right through the top of the nest.

82. **Hirundo erythrogaster** (Boddart). BARN SWALLOW.— Common summer visitant; April 25 to Sept. 7. Average date of arrival (for four years) May 1; of departure (for three years) Sept. 6. Eggs: June 4 to July 10. This is probably the most common swallow here at all times, especially where there are plenty of the old-fashioned barns and open outbuildings, to which the swallows have easy access. As the more modern barns increase with their greater tightness and difficulty of entrance, I presume this swallow will show a falling off in numbers, unless they take more to building under the outside eaves.

83. **Iridoprocne bicolor** (Vieillot). TREE SWALLOW.— Fairly common summer visitant; April 19 to Sept. 7. Average date of arrival (for four years) April 24; of departure (for three years) Aug. 30. Eggs: June 7 to 19. In my experience the nesting site here is generally some small cavity in the eaves or cornices of farm buildings, but I have found it also nesting in deserted Woodpeckers' holes in birch trees overhanging a pond. Unless at migration times, it is not nearly so numerous as the Barn and Cliff Swallows, but probably at those times equals, if it does not exceed, them in numbers.

84. **Riparia riparia** (Linnæus). BANK SWALLOW.— Fairly common summer visitant; May 6 to Aug. 30. Average date of arrival (for two years) May 11; of departure (for two years) Aug. 22. Eggs: June 3. It was not until the summer of 1914 that I came across a small colony of these birds, which were nesting in the bank of a little stream at the south end of Massawippi village, and again this year two or three pairs were found as well at another spot on the roadside (previously unoccupied) about half a mile from the first, so that it looks as though the species were extending their area of operations in that locality, the soil of which is more of a sandy nature than round here. Some of the nesting holes that I examined extended two feet into the bank.

85. **Bombycilla cedrorum** (Vieillot). CEDAR WAXWING.— Fairly common summer visitant; (April 10, 23) May 27 to Sept. 5. Average date of arrival (for four years) May 31. Eggs: June 15 to July 22. Previous to the year 1914 Cedar Waxwings had been quite an uncommon bird, but during the past two years have been fairly plentiful. The earlier date in April is for a single only, and the later for a flock of 19 (the largest I have seen so far) both for the present year 1915. They are fond of hawking over the marsh taking their food after the manner of a Kingbird. A pair built their nest in a small fir tree quite close to the verandah of my house, and it was most interesting to watch their lovable ways.

86. **Lanius borealis** (Vieillot). NORTHERN SHRIKE.— Rare transient; Nov. 3, Dec. 11. The above dates in November, 1913, and December, 1915, are the only ones on which I have observed this bird, and to make identification sure I shot the example in November, and the skin is now in my collection. I have since been informed that a bird, which from the description given, I take to be one of this species, was seen killing an English Sparrow on Nov. 24, 1914.

87. *Lanius ludovicianus migrans* (W. Palmer). MIGRANT SHRIKE. — Rare summer visitant; April 13 to Sept. 10. Average date of arrival (for two years) April 20; of departure (for two years) Sept. 4. Eggs: May 21. I have only seen this shrike on very few occasions, and then with one exception not within three miles of Hatley. In the spring of 1913 I located a nest near Massawippi in an old apple tree quite close to the road, which contained young birds. On visiting the locality again the following spring another nest was found containing five eggs also in an apple tree, and within thirty yards of the previous one, and these two are the only records I have, as the birds could not be found in the locality this year.

88. *Vireosylva olivacea* (Linnaeus). RED-EYED VIREO. — Common summer visitant; May 20 to Sept. 10. Average date of arrival (for four years) May 24; of departure (for two years) Sept. 10. Eggs: June 11 to July 22. This is certainly the most abundant of the Vireos, although since 1912 when nests of the two rarer species the Yellow-throated and Blue-headed were found, and this and the Warbling Vireo were more than usually plentiful, it has really been scarce, no more than three nests having been located during the past two years, whereas in 1912 one could hardly go out for a walk without finding one or two. This and the Yellow Warbler are the only birds that I have found victimized by the Cowbird, the one nest found this year containing a young Cowbird and one added egg of the owner only.

89. *Vireosylva gilva gilva* (Vieillot). WARBLING VIREO. — Fairly common summer visitant; May 20 to Aug. 20. Average date of arrival (for four years) May 24; of departure (for two years) Aug. 17. Eggs: June 13. This Vireo can generally be found nesting in the woods as well as in shade and apple trees in orchards, for which latter it seems to have a special liking. A pair have nested for three years in succession in an orchard near my house, twice in an apple tree and once in a maple, but during the present season, 1915, I have only observed the species at migration times.

90. *Lanivireo flavifrons* (Vieillot). YELLOW-THROATED VIREO. — Rare summer visitant; May — to Aug. 13. Eggs: June 24. I have only come across one nest of this species so far in 1912, which like that of the Blue-headed was a handsome affair, suspended from a forked branch of a beech tree nine feet above the ground, and contained four quite distinctive eggs, the spots being much larger and browner on three of them, than is usual in Vireos' eggs, whilst the fourth is immaculate, the average size of the set being .81 × .60. I can give no specific date of arrival in 1912 nor have I seen it since except in the fall of the present year 1915 when a number were observed on August 13 migrating in company with the Warbling Vireo.

91. *Lanivireo solitarius solitarius* (Wilson). BLUE-HEADED VIREO. — Rare summer visitant; May — to —. Eggs: June 26. Only a pair of this handsome species has been noted so far and their nest located in 1912. This latter was an elegant structure suspended in the forked

branch of a cedar tree six feet above the ground. It contained a full set of four eggs somewhat heavier marked and larger than those of the Red-eyed, their average size being $.82 \times .58$. The birds were not at all shy and kept in the immediate neighbourhood of the nest on several occasions when I visited it. I am unable at present to give any specific date of arrival or departure, not having observed the birds at those periods.

92. *Mniotilta varia* (Linnaeus). BLACK AND WHITE WARBLER.—Fairly common summer visitant; May 4 to Sept. 10. Average date of arrival (for four years) May 6; of departure (for three years) Sept. 5. Eggs: June 4 to 9. This tree creeping little warbler is more plentiful at migration times than in the summer, only a limited number of pairs remaining to breed. Of the three nests I have succeeded in finding so far, one was hidden away in a small hollow under a fallen tree trunk, another was placed at the foot of an alder sapling, and the third was in the upturned roots of a fallen tree three feet above the ground. They were all composed of dry leaves, moss and strips of bark, heavily lined with long black and white horse hairs, the average dimensions of the three being: outside diameter $3\frac{3}{4}$, inside $1\frac{3}{4}$ inches; outside depth $2\frac{1}{4}$, inside $1\frac{1}{4}$ inches; the second nest contained a rare set of six eggs, one of which was wreathed at the smaller end, the third a full set of five, and the first was either robbed or abandoned as I never found any eggs in it.

93. *Compsothlypis americana usneæ* (Brewster). NORTHERN PARULA WARBLER.—Rare summer visitant; May 14 to June 26. Eggs: June 5 to 26. The present year (1915) has certainly been a warbler one, and this may account for my good fortune in finding two nests of this charming and smallest of warblers, in a district where usnea lichen does not abound, and where at all events the bird must be rare at any time. Certainly I have failed to notice it in previous years in the only swampy wood where *usnea longissima* hangs in long festoons from a very limited number of trees. Here the two exquisite little nests were found both in fir trees, the first some thirty-five feet up, and the second about twenty-five feet, both pensive, attached to long streamers of usnea, and composed almost entirely (especially the latter one) of this lichen, only a very little plant down, fine red rootlets and hair being used as a lining, and containing four and three eggs respectively. The average dimensions of the two are as follows, viz: outside diameter $2\frac{3}{4}$, inside $1\frac{1}{4}$ inches; outside depth $2\frac{3}{4}$, inside $2\frac{1}{4}$ inches. As only a pair of birds were located at any one time, and seeing that the construction of both nests are similar, and the date of the second one somewhat late, I have come to the conclusion that it contained the second set of eggs from this one pair of birds. This nest (which was situated just sixty yards from the site of the first one) with the branch it was attached to, I have presented to the Victoria Memorial Museum at Ottawa, where I hope it will eventually give pleasure to innumerable bird lovers, who have not the opportunities of viewing such works of art in their natural surroundings. After the taking of this nest the birds were not seen again, nor did the fall migration produce any.

94. *Dendroica aestiva aestiva* (Gmelin). YELLOW WARBLER.— Irregular summer visitant; May 9 to Aug. 17. Average date of arrival (for four years) May 14. Eggs: May 31 to June 30. It seems strange to have to apply the term irregular to such a common and generally distributed warbler, nevertheless the following facts seem to justify the epithet. During the summer of 1911 only one pair of birds were seen and afterwards found nesting. In 1912 not a single one was observed, and the year following only one male was seen, and one nest located. In 1914 five males and three females were seen and three nests located, and the same number were found during the present year, one of which contained the Cowbird's egg already referred to. This nest was five feet up in a small fir and when found on June 27 contained the Cowbird's egg, and four of the owner, one of which had been built over by the Warbler, no doubt in mistake for the Cowbird's. On this date I removed the egg of the Cowbird, and also raised up the built over one of the Warbler, and concluded as the female had begun to sit she would go on doing so. Judge of my surprise when visiting the nest three days later to find that the Warbler had not only laid another egg, but had replaced the one in the hole I had removed it from, and had also embedded another at the side of it, and was sitting on three eggs only, surely a unique occurrence. I have the nest which is a perfect two storied one, and shows the two holes in which the owner's eggs fit, and when there only the tops are visible. The height of the eight nests found varies from three to twelve feet above the ground, two contained a full set of five eggs, one three, and the remainder four, the average dimensions being, outside diameter $2\frac{1}{2}$ ins., inside $1\frac{1}{2}$ ins.; outside depth $2\frac{1}{2}$ ins., inside $1\frac{1}{2}$ ins. In the "Ottawa Naturalist" for November, 1904, Mr. L. M. Terrill writing of the status of this bird at Bury some 35 miles northeast of here, says: "The Yellow Warbler, one of the most common summer residents in Montreal was notable by its absence, as I did not see a single specimen either as summer resident or migrant." Mr. Terrill's experience seems to bear out my own, and would appear to indicate that in this southeast corner of the Province, the bird is not nearly so plentiful as it is at Montreal and elsewhere, where large river valleys exist.

95. *Dendroica caerulescens caerulescens* (Gmelin). BLACK-THROATED BLUE WARBLER.— Rare summer visitant; May 14 to Sept. 10. Average date of departure (for two years) Sept. 6. It was not until the fall of 1914 that I became acquainted with this handsome and sleekly groomed bird. At that time only two examples were observed, but during the present year (which I have already remarked has been a great warbler one) several were seen from May to September, including a singing male on June 23, together with a female, which latter was flushed from some dense underbrush nearby, but no nest could be found, although from the actions of the birds, I am sure it could not have been so far off. On the above data I have ventured to include it as a rare breeding visitant more common during migration times.

96. *Dendroica coronata* (Linnaeus). MYRTLE WARBLER.— Rare

summer visitant; abundant transient; April 26 to Oct. 16. Average date of arrival (for four years) May 1; of departure (for four years) Oct. 13. Eggs: May 27 to June 18. Of all the warblers at migration times this is the most abundant and during the fall of 1914 it was more numerous than ever, being found in small parties in almost every conceivable place. In the spring the greater bulk pass further north, only a very limited number remaining to breed. Of the five nests that have come under my notice, all were situated in small fir trees close to the trunk from three to six feet up, and were composed externally of fine fir twigs and grass stems, lined inside with horse hair, and a good supply of feathers from various small birds. This feather lining which is usually present forms an interesting feature of these nests in as much as in some cases, the bases of the feathers are imbedded in the bottom of the nest, with the tips protruding above, thus forming a kind of little canopy over the nest. So pronounced was this in one case, where the smaller feathers of a Blue Jay had been used that I could not see the contents, until some of the tips had been put on one side. Unfortunately this interesting nest was destroyed after two eggs had been laid, the other four containing four young birds, one set of five, and two sets of four eggs respectively, the average dimensions of the nests being: outside diameter $3\frac{1}{2}$ inches, inside 2 inches; outside depth $2\frac{1}{2}$ inches, inside $1\frac{1}{2}$ inches.

97. *Dendroica magnolia* (Wilson). MAGNOLIA WARBLER.—Fairly common summer visitant; May 9 to Sept. 7. Average date of arrival (for four years) May 19; of departure (for three years) Sept. 5. Eggs: June 5 to 15. This warbler is not nearly so plentiful at migration times as the Myrtle, but the number of pairs remaining to breed exceed those of the latter bird. Of the six nests I have found so far all were in small firs from one foot three inches to nine feet up, saddled on to the branches, in one case close to the trunk, in the others from a few inches to two feet away. They were all composed of dry grasses held together by what look like little balls of some brown or white woolly substance, usually heavily lined inside with long black horse hairs, and fine red rootlets, the average dimensions being: outside diameter $3\frac{1}{4}$, inside $1\frac{3}{4}$ inches; outside depth 2, inside $1\frac{1}{4}$ inches. One contained four young birds, another a set of three, and the remainder sets of four eggs each.

98. *Dendroica pensylvanica* (Linnaeus). CHESTNUT-SIDED WARBLER.—Fairly common summer visitant; May 16 to July 20. Average date of arrival (for two years) May 20. Eggs: June 6 to 25. It was not until the spring of 1914 that I noticed this dainty little Warbler, and then only two pairs were located. The present season however has been more productive, double the number having been found breeding. Of six nests located so far, three were on the roadside the others in second growth on the outskirts of woods, one being within four feet of a Black-billed Cuckoo's nest, which somewhat weighs against the recent statement of a writer in 'The Oölogist' that one need never look for anything in the vicinity of a Cuckoo's nest, owing to their habit of eating the eggs and young of other

birds, which propensity however, does not seem to be altogether generally admitted. All were in forks of low bushes at a height of from a foot and a half to three feet and a half above the ground, and were composed in some cases of dry grasses and fir twigs, held together by spiders silk, and lined with black and white horse hair and fine red rootlets, in others the fir twigs were absent, grasses and strips of birch bark being used, with fine grasses and rootlets as a lining, sometimes fine grasses only. Five contained sets of four eggs each, the remaining one a set of three, the average dimensions being: outside diameter 3, inside $1\frac{1}{4}$ inches; outside depth $2\frac{3}{4}$, inside $1\frac{1}{4}$ inches. I have no fall records, the last bird seen in 1914 being on June 25 and in 1915 on July 20.

99. ***Dendroica castanea*** (Wilson). BAY-BREASTED WARBLER.—Rare transient; May 29; Aug. 27 to Sept. 9. Average date of departure (for two years) Sept. 3. The above date in May of the present year (1915) is the only one on which I have seen an adult pair of these birds in breeding plumage. In September, 1914, three males were seen, and this fall six were observed in August making a total of eleven birds only for the past five years.

100. ***Dendroica fusca*** (Müller). BLACKBURNIAN WARBLER.—Rare summer visitant; May 14 to Aug. 23. Average date of arrival (for two years) May 17; of departure (for two years) Aug. 17. It was not until the spring of last year, 1914, that I had the satisfaction of seeing a pair of this exceedingly handsome warbler on the outskirts of a large wood, and later on in the fall a single male. The present great warbler year however, has brought different results, 23 examples being seen in May, besides the locating of two pairs all through June, which were undoubtedly breeding, but whose nests I failed to discover, notwithstanding persistent watching and searching. The male spends most of his time singing and darting about in the tops of the tall fir and hemlock trees, and in a somewhat dense growth of these it is by no means an easy task to follow him or his mate to the nesting site.

101. ***Dendroica virens*** (Gmelin). BLACK-THROATED GREEN WARBLER.—Fairly common summer visitant; May 11 to Sept. 10. Average date of arrival (for four years) May 18; of departure (for two years) Sept. 6. This is not a particularly abundant warbler at any time, and only quite a limited number of pairs remain to breed. With regard to the finding of its nest and eggs, luck has been against me all along, for notwithstanding the fact that I have seen the female with food and building material in her beak on one or two occasions, I have never been able to follow her to the site of the nest. Searching high up and low down in firs, pines and hemlocks has brought no results except one vacated nest nine feet up in a fir which differed slightly in its construction from any other warbler's nest I have found, and which I feel sure belonged to this species, as I had seen a pair of birds about the locality earlier in the season. At Bury 35 miles to the northeast of Hatley, the species would seem to be more plentiful according to Mr. Terrill's experience, see 'Ottawa Naturalist' for November, 1904.

102. ***Dendroica vigorsii*** (Audubon). PINE WARBLER.—Rare transient; Aug. 27 to Sept. 7. Average date of departure (for two years) Sept. 5. This is a warbler which seems to have escaped my notice during the spring migration, in fact it was not until last fall that I came across it at all and then only two specimens were seen; and three more during the same period of the present year, 1915, although more persistent searching may prove it to be more plentiful than would appear from the above records. The great migration route is through the Penobscot Valley in Maine, some 160 miles or more to the east of Halley, but even there comparatively few remain to breed. It is a busy little searcher after food, creeping in and out amongst the leaves, and at migration times can be found almost anywhere in the woods, and not necessarily in pine groves, at least that is my experience.

103. ***Dendroica palmarum hypochrysea*** (Ridgway). YELLOW PALM WARBLER.—Rare transient; May 4. The above date in 1912, is the only one on which I have had an opportunity of observing this warbler, and then only one example was seen, but so near was I to the bird that there was no chance of confusing it with the Palm Warbler, as the reddish brown or rufous breast streaks were plainly visible.

104. ***Seiurus aurocapillus*** (Linnæus). OVENBIRD.—Fairly common summer visitant; May 11 to Sept. 10. Average date of arrival (for two years) May 14; of departure (for two years) Sept. 10. Eggs: June 23 to July 7. Although most of the woods contain a pair or more of these birds, I have only been able to locate three nests so far, two in June, one of which contained a set of 4 eggs, the other being destroyed after one egg had been laid, and the third in July containing 3 eggs, no doubt a second set. All three were on the ground at the foot of little bramble or other shoots and ferns, and were arched over. They were composed of moss, leaves, and grasses, lined inside with skeletonized leaves, fine grasses, rootlets and a few long horse hairs, the average dimensions of two being; outside length 5, inside $2\frac{3}{4}$ inches; outside depth $4\frac{1}{4}$, inside 3 inches; height $5\frac{1}{4}$ inches; entrance hole $2\frac{1}{4} \times 2$ inches.

105. ***Geothlypis trichas trichas*** (Linnæus). MARYLAND YELLOW-THROAT.—Common summer visitant; May 12 to Sept. 9. Average date of arrival (for four years) May 20; of departure (for three years) Sept. 7. Eggs: June 8 to July 19. Although this is a somewhat plentiful little warbler, its nest is by no means very easy to find, being well hidden away amongst the grass at the foot of some small bush, or in the midst of a tuft of long grass, surrounded with water. Of the five found so far three contained sets of three, and two sets of four eggs each. All were somewhat bulky being composed of dry leaves and coarse grasses with sometimes a little bark, the inside being lined with finer grasses and perhaps a few horse hairs, the average dimensions being, outside diameter $3\frac{1}{2}$, inside $1\frac{1}{2}$ inches; outside depth $3\frac{1}{4}$, inside $1\frac{1}{4}$ inches. Sets of this species vary a good deal in shape, size, and markings, one I have being very oblong with one egg marked at the small instead of the large end.

106. **Wilsonia pusilla pusilla** (Wilson). WILSON'S WARBLER.—Rare transient; May 21. I have only seen one example of this little black-cap flycatching warbler in five years. This was a male in 1911, which was flitting about in some low bushes near a little stream on the outskirts of a small swampy wood, and not being at all shy I had a very good opportunity of watching it for some time and making sure of its identity.

107. **Wilsonia canadensis** (Linnaeus). CANADA WARBLER.—Fairly common summer visitant; May 16 to Aug. 26. Average date of arrival (for two years) May 20; of departure (for two years) Aug. 19. Eggs: June 9 to 12. The finding of this elegant little warbler's nest is by no means an easy matter, and I consider myself lucky in having located two so far, the first of which was neatly hidden away under the fallen branch of a tree amongst a tangle of rich vegetation on the outskirts of a cool damp wood. The second was in similar surroundings, but at the foot of an alder sapling, and both contained a beautiful full set of five eggs. They were composed of dry leaves, strips of bark, moss and coarse grasses, lined inside with finer grasses and long horse hairs, the average dimensions being: outside diameter $4\frac{1}{2}$, inside $1\frac{1}{2}$ inches; outside depth $3\frac{1}{2}$, inside $1\frac{1}{2}$ inches. Last year I only saw three examples of this warbler, but during the present (1915) spring migration I counted ten examples at various times during May, besides locating three breeding pairs in June.

108. **Setophaga ruticilla** (Linnaeus). AMERICAN REDSTART.—Common summer visitant; May 14 to Sept. 9. Average date of arrival (for four years) May 15; of departure (for two years) Sept. 5. Eggs: June 3 to 13. This gay and charming little warbler is to be found in most of the woods especially those of a damp nature. Here I have generally found its nest in the crotch of a willow or alder sapling from 7 to 15 feet above the ground. It is a very compact affair composed of grasses, strips of bark, plant fibres and spiders webs woven together into a cup shape, and lined inside with fine grasses, rootlets and long horse hairs, and in two cases a few feathers were added. The average dimensions of five nests are: outside diameter $2\frac{1}{2}$; inside $1\frac{1}{2}$ inches; outside depth 3, inside $1\frac{1}{2}$ inches. Eggs vary considerably in size, one very beautiful set I have, besides being very small is heavily wreathed right round the centre of each egg.

109. **Dumetella carolinensis** (Linnaeus). CATBIRD.—Fairly common summer visitant; May 23 to Sept. 18. Average date of arrival (for four years) May 26; of departure (for two years) Sept. 13. Eggs: June 21 to July 17. The Catbird is not very plentiful either during the summer or at migration times, and during the present season, 1915, I have not found a single nest and have seen very few birds.

110. **Nannus hiemalis hiemalis** (Vieillot). WINTER WREN.—Fairly common summer visitant; April 20 to Oct. 21. Eggs: June 9. This little wren is generally more plentiful at migration times, but as a breeding species is decidedly restricted, one nest only having been located so far. This was found by flushing the bird from a small decayed stump (in the damp low lying part of a hilly wood) in a cavity of which the nest

of moss and leaves lined with feathers was neatly secreted, the hole in the side being the only indication of its whereabouts, so well did it harmonize with its surroundings. It contained five eggs faintly marked with reddish spots, incubation somewhat advanced. On a late date in June of the present year (1915) I saw two family parties, quite a pretty sight, and there is no doubt that this has been the most productive year of the past five.

111. ***Certhia familiaris americana*** (Bonaparte). BROWN CREEPER.—Fairly common transient; April 24 to May 6; (Aug. 13) Sept. 23 to Nov. 12. Average date of arrival (for four years) April 28; of departure (for three years) Nov. 1. This restless little bird is by no means plentiful and I have never seen more than two individuals together. The early date in August is for a single seen this year, 1915. I do not suppose a bird could be found whose habits whilst seeking its food are more like a piece of machinery, as starting from the foot of a tree he winds his spiral way to the top and then down he flies to the foot of another and repeats the process hour after hour. Writing in the 'Ottawa Naturalist', Vol. 17, 1903, Mr. Terrill gives an interesting account of finding a nest of this species at Robinson, a village some thirty miles to the northeast of Hatley, so it is just possible the bird may summer here on rare occasions.

112. ***Sitta carolinensis carolinensis*** (Latham). WHITE-BREASTED NUTHATCH.—Common resident. The White-breasted Nuthatch is far oftener seen during the fall and early winter months than at any other time. So far I have been unable to locate a nest probably owing to the bird's habit of frequenting the larger and deeper woods, during the breeding season, where it is hard to follow them.

113. ***Sitta canadensis*** (Linnaeus). RED-BREASTED NUTHATCH.—Fairly common transient; May 6 to 21; (June 26); Aug. 8 to Nov. 28, (Dec. 25). Previous to the present year, 1915, I had only seen four examples of this bird, two in May, 1912, and one each in August and September of 1914, the year 1913 producing none at all. However this year things have changed entirely and the bird has been met with commonly in small parties of five or six or singly from August to the end of November, the date in December being for a pair only. The status of the bird at Bury, a village some thirty-five miles to the northeast of Hatley, appears to be entirely different, for there Mr. L. M. Terrill speaks of it as a common permanent resident and mentions flocks consisting of as many as 75 individuals. Possibly the summer date of June 26 may indicate that a pair at least have bred here this season. It is more often seen at the top of some tall fir tree feeding on the seeds of the cones, than running up and down the tree trunks like its near relative the White-breasted Nuthatch.

114. ***Penthestes atricapillus atricapillus*** (Linnaeus). BLACK-CAPPED CHICKADEE.—Common resident. Eggs: May 14 to June 1. The Chickadee is certainly more numerous during the fall and spring, than it is in the summer. I have generally found its nest in decayed stubs within two or three feet of the ground, the usual number of eggs being from five to seven, and on one occasion nine. Whilst out shooting one day a Chick-

adee flew down from a nearby tree and perched right on the end of the barrels of my gun (which at the moment I was resting on my hip) where it remained for a minute or so surveying me with evident interest and curiosity. As regards the so called love note or nesting song a high whistled "Phe-be," I can only say that I have heard the birds utter it during nearly every month in the year, so that if it is a love note which I don't dispute, it is certainly not peculiar to the nesting season alone, as some I believe imagine.

115. *Penthestes hudsonicus littoralis* (Bryant). ACADIAN CHICKADEE.—Rare transient; April 20. Always on the lookout for this form of the Chickadee it was not until the above date of the present year, 1915, that I had the pleasure of making its acquaintance, on a fir clad slope at the edge of a rather large and damp wood. There were only a pair of birds which I followed about and watched for the best part of half an hour, during which time they gave me many chances of thoroughly identifying them. Their notes are certainly somewhat different and weaker than those of the Black-capped Chickadee and it was this difference that first drew my attention to them. Many times I visited the spot during the next few weeks but never saw them again. Mr. L. M. Terrill writing in the 'Ottawa Naturalist', Vol. 17, 1903, gives an interesting account of a nest he found of the Hudsonian [presumably Acadian?] Chickadee at Robinson, a village some 30 miles to the northeast of Hatley, so that it seems within the bounds of possibility that it may be found breeding here also some day.

116. *Regulus satrapa satrapa* (Lichtenstein). GOLDEN-CROWNED KINGLET.—Common transient; April 16 to 21; Sept. 17 to Nov. 28 (Dec. 25). The fall is the time when these elegant little birds are most generally to be found in small flocks frequenting the tops of fir trees more especially, from which they make sudden darts, returning to the tip of some branch, where on quivering wings after the manner of a hummingbird, they abstract some minute insect. At Robinson, a village thirty miles to the northeast of Hatley, Mr. L. M. Terrill in December of 1908 and 1909 saw several flocks daily and says that apparently they are the most common birds there at that season. The above date in December of the present year, 1915, is for a pair of birds only.

117. *Regulus calendula calendula* (Linnaeus). RUBY-CROWNED KINGLET.—Fairly common transient; May 2 to 13; Sept. 18 to Oct. 21. This delicate and sober hued little gem is by no means as plentiful as the previous one, and in my experience has oftener been seen nearer the ground in thick undergrowth than in the tree tops. There is something fascinating to me in the eye of this species, which no doubt owing to the whitish eye ring, looks very large and expressive for such a small bird.

118. *Hylocichla fuscescens fuscescens* (Stephens). VEERY.—Fairly common summer visitant; May 12 to Aug. 8. Average date of arrival (for two years) May 13. Eggs: June 2 to 15. This is by no means an abundant bird here, only five nests having been located during the past two years, as against about three times this number of the Hermit Thrush. Of the above five nests, all were placed as usual near the ground

in damp situations, except one which must form almost a record, it being 10 feet up in a fir tree close against the trunk. The eggs in my experience are just a little smaller and darker if anything than those of the Hermit Thrush, and the nests are somewhat distinctive in that the lining has always consisted of dry leaves and rootlets, as against grasses and rootlets in those of the latter, which are also placed in drier situations.

Since writing the above I find Dr. Townsend in his book "Birds of Essex County" quotes an instance in 1878 of a nest having been found at the extraordinary height of 25 feet above the ground.

119. *Hylocichla ustulata swainsoni* (Tschudi). OLIVE-BACKED THRUSH.— Rare summer visitant; May —, to Sept. —. Eggs: June 11. On the above date in June, 1914, I came across a nest of this species in a small maple sapling 9 feet above the ground, containing three eggs upon which the female was sitting. The nest was composed of coarse rootlets, fir twigs and dry leaves, and lined inside with fine grasses and black rootlets. I can give no specific date of arrival or departure, never having seen the bird except on the above occasion.

120. *Hylocichla guttata pallasi* (Cabanis). HERMIT THRUSH.— Common summer visitant; April 21 to Nov. 13. Average date of arrival (for four years) April 24; of departure (for two years) Nov. 6. Eggs: May 18 to July 3. This beautiful songster is without a doubt the thrush of the district, although there are years when it is not so plentiful as others. Their nest in my experience is invariably placed on the ground and generally at the foot of some small fir or hemlock tree whose lowest branches touch the ground, and form a good cover, the only exception to this being one that was built four feet up in a small fir tree, close to the trunk and which contained 3 fresh eggs on June 26 of the present year, 1915. I have already referred to the difference in construction of nest and size of eggs etc., to the Veery under the heading of that bird.

121. *Planesticus migratorius migratorius* (Linnaeus). ROBIN.— Abundant summer visitant; March 24 to Oct. 24 (Nov. 12). Average date of arrival (for five years) April 1; of departure (for four years) Oct. 10. Eggs: May 14 to July 26. As a rule all the Robins have disappeared by the end of September, the late date of Nov. 12 being for a single specimen only in 1914. Sets of five eggs are decidedly rare as I have not come across one during the past five years although I have examined some 68 nests with this object in view. Robins here are particularly fond of using pearly everlasting (*Anaphalis margaritacea*) in the foundations of their nests, which have been found in almost every conceivable place, but only once actually resting on the ground under a projecting ledge of rock on a sloping hillside. A pair of birds have built their nests for two successive years in a small fir tree near my house, and have reared two broods each season in the same nest. Is it merely a coincidence that when specially on the lookout this year, I noted males on March 24, but no females were seen until April 9, or do the males really precede the females? I can find no reference to the subject in any of my books.

122. *Sialia sialis sialis* (Linnæus). BLUEBIRD.—Common summer visitant; March 24 to Oct. 22. Average date of arrival (for five years) April 8; of departure (for four years) Oct. 15. Eggs: April 27 to July 30. Bluebirds are fairly plentiful here and during the past two years have been more abundant than ever. I once witnessed a pair of these birds drive out a Hairy Woodpecker from a half completed nesting hole it had made, and after gaining possession of it they immediately set to work building a nest which was completed and four eggs laid in the remarkably short space of six days. Is it also merely a coincidence the same as in the case of the Robin that I noticed males on March 24 of this year, but no females until April 5; or do the males of this species also really precede the females, as no mention of it either is made in any of my books?

Synopsis of principal events Years 1911-1915.

1911. Early nesting of Goldfinch June 3, set of 6 Chipping Sparrow's eggs found, also one of 3, all immaculate.

1912. Great Vireo year, Yellow-throated and Blue-headed found breeding, also Indigo Bunting, Scarlet Tanager seen, Pine Grosbeaks plentiful, Red-winged Blackbirds very abundant, Yellow Palm and Wilson's Warblers seen, Hermit Thrush plentiful.

1913. Bartramian Sandpiper found breeding, also Rose-breasted Grosbeak. Evening Grosbeaks seen, Pine Grosbeaks again plentiful. Swamp Sparrows and Black-capped Chickadees nesting more freely than usual.

1914. Woodcock seen, Olive-backed thrush and Veery found breeding, Vireos scarce, Crested Flycatcher plentiful, also Cedar Waxwings, Bobolinks and Myrtle Warblers. Pine Siskins first observed.

1915. Great Warbler year, Northern Parula found breeding, also Prairie Horned Lark, Sora, Cowbird and Blue Jay, Vireos scarce, White-throated Sparrows, Slate-colored Juncos and Hermit Thrush breeding plentifully, Acadian Chickadee, Killdeer and Semipalmated Plovers seen, also Green-winged Teal, Canada Spruce Grouse, Magpie and Canada Jay.

Errata.

Page 69, line 3, for leucomelas read villosus.

" 69, " 3, for Northern Hairy read Hairy.

" 69, " 12, for Northern Downy read Downy.

" 73, " 15, for Common Resident read Resident.

" 73, " 31, for March 10 read March 1.

ADDITIONS TO THE AVIFAUNA OF KERR CO., TEXAS.

BY AUSTIN PAUL SMITH.

IN 'The Auk' for April, 1911 (Vol. XXVIII, No. 2), Mr. Howard Lacey gives a list of 'The Birds of Kerrville, Texas, and Vicinity.' Embodying as it does, the observations of a close student of nature for nearly thirty years, it is a reasonably complete enumeration of the avifauna of the region covered; so that the following notes are merely meant to supplement his article, either by the addition of several species found by the writer; by replacement with forms recently differentiated, of species he has recorded; or by extension of breeding and migration dates.

Ingram (formerly Ingraham) is a small village, situated in the valley of the Guadalupe River, seven miles due west of Kerrville, and of nearly the same altitude (1675 feet); but the hills in the vicinity of the first named place, rise more abruptly and attain a greater elevation, than near Kerrville; and it is on these higher hills, and the draws that head among them, that the Upper Sonoran marks its eastern extension in Texas. A characteristic plant of this zone is the beautiful 'Wintergreen' or Texas Madrona (*Arbutus texana*); which with the Cedar (*Juniperus mexicana*), constitutes the principal arborescent growth on many of the hilltops. Ingram itself, lies well within the lower Sonoran, as may be inferred from the scattering mesquite growing near by; as well as the Cypress (*Taxodium distichum*) lining the river. It is noteworthy that within sight of this village are several large trees of the American Elm (*Ulmus americana*); also a deciduous *Sophora*, possibly *S. affinis*.

All notes pertain to observations made within a radius of ten miles of Ingram; during a period extending from November 18, 1914, to July 15, 1915. Altogether some 150 forms were recorded from this area.

Querquedula discors. BLUE-WINGED TEAL.—There is little doubt that this teal breeds in the region as it was present throughout June, usually frequenting the small streams tributary to the Guadalupe.

Pisobia fuscicollis. WHITE-RUMPED SANDPIPER.—Opposite Ingram,

the river broadens out, forming a number of small mud flats; it was there that most of the wading birds were observed. The present species was noted between May 8 and 25 and during most of that period, was the most abundant member of its family.

Pisobia bairdi. BAIRD'S SANDPIPER.—On May 26 a lone individual of this species was recorded; it was in the company of a small flock of Semipalmated Sandpiper.

Pisobia minutilla. LEAST SANDPIPER.—As far as I could ascertain, the Least Sandpiper was much less numerous than the following with which it generally associated. Both species appeared early in May, and remained up to about June 1.

Ereunetes pusillus. SEMIPALMATED SANDPIPER.—This species was quite abundant, considering the limited area suited to its requirements; especially so during the final two weeks of its stay. Neither this nor the preceding three species are listed by Lacey.

Helodromas solitarius cinnamomeus. WESTERN SOLITARY SANDPIPER.—It was the western subspecies of the Solitary Sandpiper that I found occurring. It was present during May but never more than one or two birds were seen in a day, and at all times very shy.

Actitis macularia. SPOTTED SANDPIPER.—Lacey surmises that the Spotted Sandpiper breeds in the region. This is undoubtedly so, as I saw the species up to the day preceding my departure. It was first noted about May 5.

Colinus virginianus texanus. TEXAS BOB-WHITE.—Nests containing sets of 23 and 30 eggs were found. These were in all probability community nests, as the eggs in both followed several types in form and were of considerable difference in size.

Meleagris gallopavo intermedia. RIO GRANDE WILD TURKEY.—There can be little doubt that, at the present time, Wild Turkeys exist in greater numbers in Kerr and adjoining counties than in any other part of Texas. Their abundance may be accounted for, as the result of the encroachment of the Cedar and various species of scrubby oaks upon lands formerly under cultivation or in pasture; to the decrease in numbers of the Armadillo (*Tatu novemcinctum texanum*) which of late years have been much hunted for commercial purposes; and to the enactment of a law limiting the open season and the number that may be killed. During the winter spent in the region several heavy snowfalls occurred. These caused many turkeys to seek open spots in the valleys and along fence rows, often in the vicinity of human habitations, and I recall one flock of seven hunting for several hours within a hundred feet of the building I lived in.

Polyborus cheriway. AUDUBON'S CARACARA.—Seen on several dates during March, usually along the river, but occasionally small streams higher up in the hills.

Strix varia albogilva. TEXAS BARRED OWL.—Although Lacey judges this owl to be a rather common resident, I was able, during my residence, to locate but one, and to hear perhaps one or two others. Evi-

dently the growth existing at the present day along the river is not dense enough to suit its requirements, and it is only in the heavily wooded draws among the hills that it is now found.

Otus asio hasbroucki. RIDGW.—The Screech Owls that breed along the Guadalupe, and its tributaries, within the limits defined, seem typical of this recently described subspecies. All the examples I collected conform in every particular with the original description (Ridgway, *Birds of N. and Mid. Amer.*, Vol. VI, 694), as compared with *O. a. mcalli*; and when compared with *O. a. aikenii*, are found to have the barrings much heavier, especially on the thighs, as well as in being dichromatic. Two specimens secured during the evening of June 26; one an adult female, and the other an immature two-thirds grown, that was being fed by the old bird, both were in the brown phase of plumage, proving this assertion.

Coccyzus americanus (occidentalis?) CALIFORNIA CUCKOO.—Based upon an examination of the material I collected, the cuckoos found along the upper Guadalupe had better be considered as intermediates. Several males in this series barely average the measurements of typical *americanus*.

Ceryle americana septentrionalis. TEXAS KINGFISHER.—The Texas Kingfisher was rarely observed until a point about three miles above Ingram was reached; but from thence up the river it was fairly common (a pair or two for each mile). Only once did I meet with it along the smaller streams, although the Belted Kingfisher favored these commonly.

Centurus aurifrons. GOLDEN-FRONTED WOODPECKER.—A limited number of this species were resident in the valley, but it rarely ascended into the hills; and then only during the late fall and winter.

Colaptes auratus luteus. NORTHERN FLICKER.—It is apparent that during the winter of 1914-5, an irruption of this Flicker occurred within the region, as Mr. Lacey, in a recent conversation with me, stated that he had never met with *luteus* within Kerr County. I found it present almost throughout the winter, at times outnumbering *C. cafer collaris*. Intermediates between the two were collected.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—I found this species to be a common spring transient, occurring between May 1 and June 1, inclusive. It frequented both stream courses and hillsides.

Empidonax trailli trailli. TRAILL'S FLYCATCHER.—This Flycatcher made its appearance about May 10 and was often observed up to the 21st. It showed the usual partiality for brushy growth fringing streams; perching well within cover of the foliage and as it rarely uttered any note, would have been difficult to detect, had it not been for the fact that it remained in one position but a short time.

Empidonax minimus. LEAST FLYCATCHER.—Recorded as a common transient between May 8 and 25, inclusive. The first individual observed was found perched in a clump of Spanish Oak (*Quercus texana*) on an otherwise barren hilltop. It generally preferred the immediate vicinity of watercourses, but was less prone to seek heavy cover than

trailli; although equally quiet during its presence. Lacey's account does not include this or the preceding species.

Aphelocoma texana. TEXAS JAY.— This very local form keeps well within the Upper Sonoran, except on occasions when it descends to the streams to drink, mostly after dry weather has set in; but it quickly returns to its natural haunt — hillsides covered with a mixed growth of cedar and oak. It was found to congregate in flocks, even during the breeding season which, as Lacey has correctly stated, occupies late March and early April, so perhaps only a portion of its numbers nest annually. The Texas Jay while affecting a varied diet is very fond of the acorns of the Spanish and shin oaks, searching these out and eating them after they have sprouted. Until the plumage of this Jay is much worn, it closely resembles *A. woodhousei*, for the brown on the back is much obscured by a slaty cast in the fresh plumage while many of the adults have the under tail coverts strongly tinged with blue.

Molothrus ater ater. COWBIRD.— Judging from material secured this is the breeding form; but several examples taken in late March and in April possess a heavier, shorter bill than is usual in true *ater*; although seemingly not variety *obscurus*.

Astragalinus tristis tristis. GOLDFINCH.— This common winter visitant was noted as late as April 7 frequently associating in flocks with the following.

Astragalinus psaltria mexicanus.¹ Examination of a large series of adult males from the region shows a uniformity in the intensity of the black on the upperparts. Even examples taken in winter present little evidence of a greenish tinge. Although Lacey considers it as a summer visitant only, I found it throughout my stay. Limited in numbers during most of the winter but of common occurrence after March 1.

Passerculus sandwichensis nevadensis. GREAT BASIN SAVANNAH SPARROW.— The form found commonly wintering was *alaudinus*, as was shown by the identifications made by the Biological Survey. One skin however (taken March 7) was returned labelled *nevadensis*. Savannah Sparrows were present up to April 5.

Ammodramus savannarum bimaculatus. WESTERN GRASSHOPPER SPARROW.— As Lacey seems to consider the Western Grasshopper Sparrow only a winter visitant, it seems worthy of record to give the final date — May 8 — upon which I noted it. This bird was most frequently encountered on hilltops where the cedar was scattered enough to allow grass to grow.

Zonotrichia querula. HARRIS'S SPARROW.— The presence of this distinguished looking sparrow was coincident with the coldest period of the year, or from January 25 to February 5, when small flocks were several times seen.

Zonotrichia albicollis. WHITE-THROATED SPARROW.— Appears to be an uncommon winter visitant. Lacey gives one record only, while I observed at least two in company of various other sparrows, February 6.

¹ The race *mexicanus* is not recognized in the A. O. U. Check-List.

***Aimophila ruficeps eremœca*.** ROCK SPARROW.—I found the Rock Sparrow most numerous during the winter months. It is however, a common resident of the region; much more abundant over a given area than I found either *scotti* in Arizona, or *ruficeps* in California. It keeps closely to heavy brush covering hillsides, or (principally in winter) weedy patches along streams. During the breeding season, males were now and then to be seen, mounted on the topmost branch of a tree, singing in a rather dispirited manner.

***Spizella pallida*.** CLAY-COLORED SPARROW.—The date of departure, given by Lacey for this species, is April 24. I only noted it between May 10 to 13; when a limited number, mostly singly or in pairs, were seen feeding along roadsides.

***Spizella pusilla arenacea*.** WESTERN FIELD SPARROW.—During the winter months this is the prevailing form; it withdraws rather gradually, not finally departing until after the middle of April when *pusilla* alone remains to breed.

***Melospiza melodia juddi*.** DAKOTA SONG SPARROW.—In the list given by Lacey, *melodia* is the name given to the Song Sparrows visiting the region; and it is quite likely that the eastern form does occur though all examples that I forwarded to the Biological Survey were assigned to the variety *juddi*. The species is a common winter visitant, usually found in brush or weeds in vicinity of streams. Departs early, none seen after March 17.

***Pipilo erythrophthalmus erythrophthalmus*.** TOWHEE.—On January 19, the familiar notes of the Towhee, issuing from a plum thicket, drew my attention. The bird being secured, proved to be a female, of large size, and in high plumage. I presume it to be an unusual visitant, as this was the only instance that I met with it, and Lacey makes no mention of it.

***Petrochelidon lunifrons tachina*.** LESSER CLIFF SWALLOW.—There can be little doubt that true *lunifrons* occurs in migration but all examples of this species secured, from the date it was first seen (April 15), seem to be fairly typical of *tachina*. This form is by far the most numerous of the breeding Cliff Swallows. *P. fulva pallida* appears not to occur in the eastern half of the county, being first met with about six miles west of Ingram, where several isolated colonies nest.

***Lanivireo solitarius solitarius*.** BLUE-HEADED VIREO.—I met with the Solitary Vireo on two dates, April 28 and May 17. The single bird observed on the later date, was located by its rich and voluble song, with which I was previously unacquainted.

***Vireo atricapillus*.** BLACK-CAPPED VIREO.—This conspicuously marked species arrived about April 5. Nest-building had begun, a nearly completed one being found April 13. The Black-capped Vireo is sometimes found breeding in proximity to *V. griseus* but generally its choice of nesting site is in its favorite feeding haunts—low shin oak, or dwarf plum thickets, on dry hillsides rarely resorted to by the White-eyed Vireo.

The male *atricapillus* is rather easy to locate by reason of its subdued, though persistent, song; the female however, being of duller plumage and quiet mien, is less likely to be met with, and when incubating can almost be touched before leaving the nest.

Vermivora celata celata. ORANGE-CROWNED WARBLER.—The Orange-crowned Warbler was found to be present throughout the winter, mostly associated with flocks of Kinglets, Chickadees (*Penthestes carolinensis agilis*) and Titmice (*Bæolophus atricristatus sennetti*) usually hunting among the cedar brake. It remained up to at least April 21.

Dendroica auduboni auduboni. AUDUBON'S WARBLER.—While not mentioned by Lacey, this species was to be expected in the region. On April 24, I found several individuals hunting over a cypress, growing along the river, near Ingram.

Dendroica dominica albilora. SYCAMORE WARBLER.—The arrival of this species was much delayed in 1915. Lacey gives the average date of its appearance as March 22, yet I did not meet with it until April, although frequently visiting its favorite haunt — the cypress groves along the river. As this is the western limit of the breeding range, it was to be expected that the individuals found here would develop the sub-specific characters, which is evidently true, as none of the skins I have examined show any trace of yellow on the superciliary stripe.

Dendroica chrysoparia. GOLDEN-CHEEKED WARBLER.—This much remarked species did not make its appearance until March 27, the latest date, according to Mr. Lacey, within his experience. The adult males (third year), preceded the females and younger males by some five days. Until nidification is well advanced, it was seldom found outside of the 'cedar brake'; thereafter it was of more general dispersion and after the young were on the wing, resorted to the walnut thickets. It is my impression that the Golden-cheeked Warbler hunts over, rather than through, the foliage of a tree. A perhaps peculiar trait of this species is its U-shaped sallies after flying insects, from the lower limbs of a tree. While as a rule a very active bird, I have seen it sitting motionless for minutes at a time at any hour of the day.

Seiurus noveboracensis notabilis. GRINNELL'S WATER-THRUSH.—It is a coincidence, worthy of note, that the single record Lacey gives for this form, May 10, 1895, is the same day of the month upon which I secured the only individual seen.

Oporornis tolmiei. MCGILLIVRAY'S WARBLER.—Several birds of this species were seen, and one secured, May 21. Apparently an original record for the county.

Dumetella carolinensis. CATBIRD.—Lacey considers this familiar bird an uncommon visitant, yet I met with it twice in the region — May 10 and 13.

Catherpes mexicanus conspersus. CAÑON WREN.—Dr. Louis B. Bishop writes me that Mr. Oberholser considers the Cañon Wrens from the region to constitute a distinct form, *polioptilus*. It is a generally distributed resident wherever bluffs occur.

Thryomanes bewicki eremophilus.¹ Among the large series of Texas Wrens collected, one skin was found that could not be allocated, it being much paler in plumage than *cryptus*, the common resident form, and also differed from *bairdi*. On being sent to the Biological Survey, it was pronounced by Mr. Oberholser to be *eremophilus*, and he informs me that it must be considered as a rare or casual visitant to the region. The example in question was taken March 12.

Troglodytes aëdon parkmani. WESTERN HOUSE WREN.—A rather common winter visitant. A bird shot April 24, appears to record an unusually late date for the bird so far south.

Certhia familiaris americana. BROWN CREEPER.—One shot at the edge of a cedar brake, April 2; not otherwise noted.

Regulus satrapa satrapa. GOLDEN-CROWNED KINGLET.—I found it present nearly throughout the winter, usually outnumbering *R. calendula*. It is probably of irregular irruption, as Mr. Lacey told me he missed it some years entirely. The last individuals were observed April 2.

Hylocichla ustulata swainsoni. OLIVE-BACKED THRUSH.—A single bird shot May 17, as it was perching in the underbrush of a heavily wooded draw, adds another species to the county list.

Hylocichla guttata pallasi. HERMIT THRUSH.

Hylocichla guttata sequoiensis. SIERRA HERMIT THRUSH.—These two forms of the Hermit Thrush were commonly present throughout the winter; the latter variety remaining until April 16.

Planesticus migratorius propinquus. WESTERN ROBIN.—A bird shot March 18 is identifiable as above. *P. migratorius*, the eastern form, is a common winter visitant; departing April 13, in 1915.

¹ This race is not regarded as separable from *bairdi* in the A. O. U. Check-List.

TWO NEW FORMS OF PETRELS FROM THE BERMUDAS.

BY JOHN T. NICHOLS AND LOUIS L. MOWBRAY.

In 'The Auk,' April, 1906, p. 217, Mr. Thomas S. Bradlee recorded as *gularis* an *Æstrelata* from Bermuda. Since that date the mounted bird has been in the Bermuda Museum of Natural History, by which it has recently been courteously loaned to Mr. Mowbray and critically examined by the writers. It is closer to *brevipes* Peale, of the western Pacific, but unquestionably distinct. This specimen is here made the type of a new species, and a Bermuda *Puffinus* (larger than *lherminieri* which breeds rather commonly in the Bermudas) the type of a new race.

***Æstrelata cahow* sp. nov.**

The type specimen, a mounted bird, Coll. Bermuda Museum of Natural History, was taken by Mr. Mowbray, Feb. 22, 1906, in a rock crevice, about 20 feet above high water, Southeast side of Castle Island.

Upper surfaces dark sooty, darkest on the primaries, grayish on the back and nape. Tail coverts (partially lost) dark gray, with white bases. Rectrices grayish black with white bases. Inner web of the two outer feathers white almost to the tip. Sides of the breast sooty gray. Primaries dark beneath. Under wing-coverts white, with a peculiar oval dark spot just inside the exposed primaries, as in *hasitata*. Tail cuneate. Forehead, lores and underparts white. Center of forehead and white region above the eye finely speckled with dark. The dark color from the side of the neck extends narrowly forward under the eye. Bill dark. Legs, basal third of foot, and inner toe, pale, remainder of foot dark. Wing $10\frac{1}{4}$ in. Tail $6\frac{1}{2}$. Culmen $1\frac{3}{8}$. Tarsus $1\frac{3}{8}$. Middle toe and claw $1\frac{3}{4}$.

The name "cahow" was used by early settlers in Bermuda for an *Æstrelata* abundant at Cooper's Island, a mile at the most from where the type was taken and presumably of the same species. Numerous partially fossil bones (including skulls) which, after comparison, we believe to belong to the form here described have been found by Mr. Mowbray in various caves in the eastern end of the Bermudas, some about a half mile from where the bird was taken.

Puffinus puffinus bermudæ subsp. nov.

The type, a skin, Coll. of L. L. Mowbray, March 10, 1905, sitting on a single white egg in a crevice in Gurnet Head Rock.

Close to the Manx Shearwater of which it is made a race, but differing from that species about as much as does *P. yokouanus* of the Mediterranean. Slightly larger than *puffinus*, with less gray on axillars and under tail-coverts than *yokouanus*. The three should probably stand as geographic races.

Above sooty black. Below white, the colors somewhat mingled at the line of demarkation at the level of the gape. Under tail-coverts white, the lateral ones outwardly mottled with gray. Under wing-coverts white. Axillars with subterminal dark gray bars and white tips. Wing 9 in. Tail $3\frac{1}{4}$. Bill $1\frac{7}{16}$. Tarsus $1\frac{1}{8}$. Middle toe and claw $2\frac{1}{8}$.

The bird has been compared with a specimen from the Orkneys in the American Museum, two from Wales and one from the Bosphorus in the collection of Dr. Jonathan Dwight. The British birds have the culmen slightly less than $1\frac{3}{8}$ to $1\frac{1}{4}$, tarsus $1\frac{11}{16}$ to $1\frac{13}{16}$, middle toe and claw $1\frac{7}{8}$ to 2. In the Bosphorus bird the culmen measures just over $1\frac{3}{8}$, tarsus $1\frac{13}{16}$, middle toe and claw $2\frac{1}{16}$.

This is doubtless the form recorded as *anglorum* breeding in the Bermudas (Savile G. Reid. *The Birds of the Bermudas*, Zoologist, Oct. and Nov., 1877, reprint 1883, p. 41). No bones of this species were found with those referred to *Æstrelata cahow*, although mixed with them were skulls and other bones clearly referable to *P. lherminieri*.

GENERAL NOTES.

The Type Locality of *Uria l. troille*.—The Common Murre (*Uria troille troille*) was named by Linnæus in his 'Fauna Suecica,' ed. 2, 1761, p. 52. He gives only one reference, Martens' 'Spitzbergische Reise,' which contains both description and a plate of a specimen taken July 25, 1671, in the northeastern part of Spitzbergen. There is nothing in Martens' description or plate that would not apply equally well to *Uria lomvia*, and as a fact this is the bird which Martens had in hand, for the bird we now know as *Uria troille* does not occur anywhere in Spitzbergen, while *Uria lomvia* still occurs there "by thousands" as Martens says he found them there at latitude 80° N., much farther north than *troille* ever ranges.

The description of Linnæus is fuller in some particulars than that of Martens showing that Linnæus had a specimen, which would have come from the coast of Sweden and which would actually have been the species now known as *troille*, since this is the form which occurs there and not *lomvia*. Therefore the type locality of *Uria troille troille* should be given as Sweden instead of Spitzbergen.—WELLS W. COOKE, *Biological Survey Washington, D. C.*

The Pomarine Jaeger and the Purple Gallinule in Western Missouri.—A Pomarine Jaeger (*Stercorarius pomarinus*) was taken at Eaton Bend on the Missouri River, a few miles below Kansas City, Mo., on November 28, 1915, by Joe Barlow. As far as I can learn this is the first record of the capture of this species in Missouri. On December 31, 1915, an immature Purple Gallinule (*Ionornis martinica*) was captured alive on the flats near Kansas City, Mo., and given to Miss Clements of Independence, Mo., who brought the bird to the attention of the Kansas City Bird Club. Widmann gives two records for the Purple Gallinule for Missouri, both in April, 1877, in the vicinity of St. Louis. (Birds of Missouri, p. 61).—RALPH HOFFMANN, *Kansas City, Mo.*

The Breeding Range of Leach's Petrel.—In 'The Auk' for April, 1915, p. 173, Mr. R. C. Murphy states that the breeding range of *Oceanodroma leucorhoa* should be given as follows:—"Southern Greenland and the Færoes south to Maine and the Hebrides." Curiously enough the breeding range of this species is incorrectly given in both the 'Hand List of British Birds' and also in the 'B. O. U. List of British Birds.' In the former it is said not to breed in Europe outside the British Isles, and in the latter to "occur," in Iceland. As a matter of fact there is a large breeding colony on the Westmann Islands, southwest Iceland, but as far as I am aware there is no evidence of nesting anywhere on the Færoes. Laubmann in his recent paper, 'Fauna Færøensis,' makes no mention of it, and Müller & Feilden state that it is not known to breed there. If Mr. Murphy

has more recent information on the subject, it would be as well to publish it. The only known breeding places on the East Atlantic are the Westmann Isles in Iceland, the Flannans, St. Kilda group and N. Rona in Scotland and islets off the Kerry and Mayo coast in Ireland.—F. C. R. JOURDAIN, *Appleton Rectory, Abingdon, Berkshire, England.*

Barrow's Golden-eye at Wareham, Mass.—I am indebted to Mr. C. A. Robbins for the freshly-prepared skins of a female Barrow's Golden-eye and for permission to report that the bird was killed in Wareham by L. P. Hacket, a local gunner, on November 27, 1915. Mr. Robbins states further that "it was shot from a stone breakwater within one hundred yards of the shore and at a point almost exactly at the head of the broadest expanse of Buzzard's Bay. Although other Golden-eyes were feeding or in flight near by, this bird was accompanied by but one other (a female or young male)." On comparing the specimen with series of skins in my collection I find that with respect to every essential characteristic of both form and coloring it is a perfectly typical representation of *C. islandica*. The interest attaching to its occurrence is enhanced by the fact that so few birds of its sex and species have heretofore been reported from anywhere along the Massachusetts Coast. No doubt they visit this oftener than we realize, being overlooked because so closely similar to female Whistlers.—WILLIAM BREWSTER, *Cambridge, Mass.*

Lesser Snow Goose (*Chen h. hyperboreus*) in Massachusetts.—On December 7, 1915, a bird of this species was shot as it swung in alone to some decoys at Eagle Hill, Ipswich, Mass., by Mr. Wm. O. Thrasher of Peabody. He gave it to Mr. Charles E. Clarke of Tuft's College, Mass. The latter had gone to Ipswich to study the birds, and had recognized this rare species hung up outside the shooting shack. Mr. Clarke kindly gave the bird to me for my collection and for record. It proved to be a male in good condition but not fat. Its plumage indicated a bird of the previous year. The feathers about the head and breast were tinged yellowish brown as if stained with iron rust.

Definite records of this goose in Massachusetts are few, although it is probable that the majority of the indefinite records of Snow Geese belong to this species and not to *Chen h. nivalis*. The only previous records for Essex County of specimens of the Lesser Snow Goose are: one, now in the Peabody Academy, taken at Lynn Beach in 1866, one taken by B. S. Damsell at Amesbury in 1888, and one, now in the collection of Mr. William Brewster, taken at Ipswich on October 26, 1896.—CHARLES W. TOWNSEND, M.D., *Boston, Mass.*

Blue Goose (*Chen caerulescens*) in Maine.—Last winter when visiting some of the islands of Penobscot Bay, Knox County, Maine, in quest of sea birds, I saw and examined a mounted specimen of the Blue Goose in possession of Mr. Walter Conley of Isle Au Haut.

Mr. Conley shot the bird November 13, 1913, at Little Spoon Island, a small island near Isle Au Haut. This specimen is of so unusual occurrence on the Atlantic coast that I am interested to have this instance recorded. At the present time I understand that the bird is still in Mr. Conley's possession.—CHARLES E. CLARKE, *West Somerville, Mass.*

A Banded Canada Goose.—On December 13, I shot a very large Canada Goose at the Pine Island Club, N. C. Both legs carried aluminum bands. The right numbered 312, the left, 314. This note if published in 'The Auk' may possibly be seen by the bander who would naturally in return give the facts regarding the banding.—HAROLD HERRICK, 25 *Liberty St., New York.*

Two Trumpeter Swan Records for Colorado.—A specimen of this species (*Olor buccinator*), the sex of which was not determined was shot by Mr. Walter Scott, near Timnath, seven miles southeast of Fort Collins, Colo., on November 18, 1897. Another specimen, a male, was found dead by Mr. J. L. Gray, at Rocky Ridge Lake, seven miles north of Fort Collins, on November 25, 1915.

Both specimens are mounted in the College Museum.—W. L. BURNETT, *Colorado Agricultural College, Ft. Collins, Colo.*

King Rail (*Rallus elegans*) in Massachusetts in November.—On the 12th day of November, 1914, a King Rail was captured in Longmeadow. This is the latest time in the autumn that the presence of one of these birds has been noted in this region. Early writers on bird life in Massachusetts placed the King Rail in the class of birds whose presence in this State was accidental, and with only two records of their appearance in any part of the State, while now there are in collections here a half a dozen specimens of this bird that have been taken in the vicinity of Springfield in recent years.—ROBERT O. MORRIS, *Springfield, Mass.*

Willetts in Migration.—During the last days of May, 1907, while on my way from Havre to New York on the S. S. 'La Loraine,' I saw at sea a remarkable congregation of Willetts (*Catoptrophorus semipalmatus*).

It was in the middle of the morning of a gray, but not foggy, day, when we were off the Grand Banks of Newfoundland, that I noticed a considerable gathering of birds resting on the water in the immediate path of the ship. As we approached them I thought they looked like shore birds, and as the vessel drew quite close to them those immediately near it rose on wing and flew off to right and left, and again alighted on the water among their fellows. In the way in which they left the path of the vessel they reminded me of similar flights of waterfowl seen in Alaska.

When the birds took wing, they were at once recognized as Willetts, and there must have been somewhere near a thousand of them, not all packed together in a dense clump on the water, but more or less scattered out, in

groups of forty, fifty or a hundred, yet all fairly near one another, and suggesting a single flock. They seemed to leave the water reluctantly and gave me the impression that they were weary.

The long flights demonstrated for many shore birds had always puzzled me, for it seemed hardly possible that such flights could be made without rest or food. Here, however, was an apparent explanation of the matter. The birds might stop to rest anywhere in the course of their long journey, and, no doubt, in many places food in abundance might be found floating on the water.

Though I had never seen or even heard of anything like this sight, I have taken it for granted that ornithologists had often observed and reported on this matter. I think I once mentioned it incidentally in 'Forest and Stream' in connection with some notes on shore birds. Mr. E. W. Nelson, to whom I mentioned the matter recently, advised me that the matter was new to him and suggested that this note be sent to 'The Auk.'—Geo. BIRD GRINNELL, *New York City*.

American Golden Plover (*Charadrius d. dominicus*) at Nantucket Island.—On September 6, 1915, I drove to the extreme western end of the island, and remained there an hour or two without seeing any birds. I interviewed the crew of the Life Saving Station at Maddeket, several of whom I knew, none of them had seen, or heard any Golden Plover or Eskimo Curlew passing this summer. One of the men said he had heard of five Golden Plover living in a certain field, the owner of which preferred watching, to shooting them. In the afternoon I drove to the south side of the Island (Surfside). I called at once on the former captain of the Life Saving Station located there, who was an old acquaintance, and a gunner. He informed me that his grandson had shot a Golden Plover the day before, he showed me the legs which I identified. He said there had been four in all living at Nobadeer pond, and that I could probably find the other three still there. I suggested we harness up his horse and ride down to the pond, he and his grandson taking their guns. On arrival we saw the three Golden Plover running about, two black and white breasted birds, and one 'pale-breast' (young); we succeeded in shooting the latter, which I later had made into a skin. I am of the opinion that these birds were the same ones which occupied the protected pasture mentioned above. They constitute the only records of this plover I have been able to obtain for the island of Nantucket this season. I also saw, while at the Nobadeer Pond, two Hudsonian Curlew, and two of the larger Yellowlegs.—GEORGE H. MACKAY, *Boston, Mass.*

Nest of the Alder Flycatcher on the Pocono Mt., Pa.—Among the low shrubs, birches and swamp grass, bordering a lake on the Tobyhanna River, Monroe County, Pa., the Alder Flycatcher (*Empidonax traillii alnorum*) is apparently not uncommon, for at least three pair can be found within a radius of two or three miles. The discovery of the nest is, how-

ever, a difficult problem, and has eluded the search of a number of ornithologists around this very lake for several years. On June 12, 1915, the nest was found by J. D. Carter in a low shrub well hidden and within twenty-four inches of the ground. One egg was laid on the 14th, but the nest was found destroyed on the 27th when it was again visited. On July 17 I found a new nest containing three fresh eggs in almost the same spot or within six feet of the first one; it was also well hidden, and it was by the luckiest chance that I happened to see it. The bird was not flushed either time, and was generally heard uttering the short harsh note from a hundred to five hundred feet away, giving little clew to the general position of the nest. While I was photographing, the parent bird ventured within fifteen feet of me, but all the time hidden in the thicket and occasionally uttering an unconcerned low single note. The nest was built of soft bleached grass, lined with fine thin material, the eggs being rich cream and spotted almost exactly like the Wood Pewee's eggs. I think this nest is the first recorded for the State of Pennsylvania.—WM. L. BAILY, *Ardmore, Pa.*

Yellow-bellied Flycatcher (*Empidonax flaviventris*) Breeding on the Pocono Mountain, Pa.—A nest containing four eggs was found along the Tobyhanna Creek, on Pocono Mountain in Monroe County, Pa., by Geo. H. Stuart, 3rd., in company with J. Fletcher Street on June 27, 1915. I had found a nest containing four fresh eggs in almost the identical spot eight years previous, June 23, 1907, in company C. G. Abbott, and though we did not collect the nest we obtained excellent photographs of the eggs and one of the birds on the nest. On July 17, 1915, I found a third nest containing three young about two days old, which I photographed; and I also obtained another picture of the parent near the nest. During an hour's stay within about thirty feet of the nest, both birds were near by, somewhat anxious, and uttering every few seconds their drawling "pe-a."

The nesting sites were all in little open sunny spots of wet sphagnum in the dense secluded forest of spruce, hemlock, balsam and tamarack; and all through the moss grew the wintergreen, bunch berry and occasionally the fragrant white swamp azalia. The nests were hidden in the sides of little mounds of sphagnum; only a little black flat hole was visible, which did not even look suspicious. The nest which had young was composed first of small spruce twigs, and then lined thickly with pine needles only, and set right in the sphagnum deeply cupped. As I had not flushed the bird, I poked my finger into it for investigation before I knew it to be a nest. Mr. Stuart's nest, which contained eggs, was simply lined with pine needles. This is the only spot on Mt. Pocono where we have found this species breeding, and it is safe to state that there were at least three pairs in the vicinity.—WM. L. BAILY, *Ardmore, Pa.*

Swainson's Hawk in Illinois.—An interesting record is the capture of a beautifully marked specimen of *Buteo swainsoni*, near Waukegan, by

a boy, on October 13, 1914 (H. K. C. No. 17970). This bird was taken to Mr. R. A. Turtle, the Chicago taxidermist, who kindly presented it to me. It measures: length 20 in., extent 49 in., wing 14.75 in., tail 8.75 in. Cere, legs and feet yellow. Iris slaty brown. It is dark brown above, mottled with light brown and yellowish buff; below from bill to tail, clear yellowish buff with dark brown markings on the sides of the breast. This is the first Swainson's Hawk I have ever seen taken here.—HENRY K. COALE, Highland Park, Illinois.

Nesting of the Crossbill (*Loxia curvirostra minor*) in Crook Co., Oregon.—During the summer of 1914 while camped in the yellow pine forest near the little town of Sisters, Crook County, Oregon, I was fortunate enough to locate the nest of the Red Crossbill. On July 21, while standing near camp I saw a female fly from the ground with a large bunch of grass in her bill. She flew to a tree near by, where she perched for a moment, and was joined by the male, when both birds flew to another tree farther on. I arrived under the tree just in time to see the female disappear in a dark mass that I soon made out to be the nest. The male perched on a small twig near by for some time, but finally flew away leaving the female in the nest, where she stayed several minutes, giving me the impression that house building was about over. I watched this pair several days and saw the female carry several loads of nesting material, but, although the male was often near I did not see him help in any way. Both birds were very noisy while near the nest. On July 26, my time was up in this locality, so on that date the female parent, the nest, and the one egg it contained were taken. The nest was located near the end of a branch, about fifteen feet from the trunk and about ninety feet from the ground in a large yellow pine (*Pinus ponderosa*). Dry sage-brush twigs, rootlets, weed and grass stems were used in its construction. The whole appearance of the nest suggested that of the House Finch nest on a slightly larger plan. The one egg was pale bluish, spotted and streaked with shades of brown and purple, mainly about the larger end.—STANLEY G. JEWETT, Portland, Oregon.

The Barn Owl (*Aluco pratincola*) in Massachusetts.—On October 31, 1915, a male Barn Owl was captured in Longmeadow, a few miles from Springfield, Mass. There is but one other record of the occurrence of this species in so much of the Connecticut valley as lies within the borders of Massachusetts.—ROBERT O. MORRIS, Springfield, Mass.

Cowbird wintering in Massachusetts.—On November 26, 1915, beside a small swamp, on the borders of Flax Pond, Lynn, Mass., I found a male Cowbird (*Molothrus ater ater*) in company with a flock of English Sparrows. On December 26, I received a postal from my friend, Mr. G. M. Bubier, announcing that he had that day seen a male Cowbird, associating with English Sparrows, beside Strawberry Brook, the outlet of Flax Pond,

and about three fourths of a mile from where I saw the Cowbird in November. Today, December 30, I found Mr. Bubier's Cowbird within a few rods of the place he reported him, and still accompanied by his English retinue.—ARTHUR P. STUBBS, *Lynn, Mass.*

Another Hybrid Warbler from Northern New Jersey.—On July 8, 1915, while in company with Mr. Samuel N. Rhoads on the edge of a rhododendron swamp near Sussex, N. J., the writer secured a specimen of the hybrid, supposed to result from the interbreeding of the Golden-winged and the Blue-winged Warblers (*Vermivora chrysoptera* and *V. pinus*). The specimen was a young bird of the year on which the wing bands were not fully developed. Nevertheless they were developed sufficiently to show bright yellow. This marking, taken with the general appearance of the bird, made it approximate *leucobronchialis*, but on the other hand the under parts were quite strongly suffused with yellow and the throat was dusky.

This bird, in company with several other young, at least two more, and with an adult male *chrysoptera*, was under our observation for nearly an hour. On several occasions the birds were within a few feet of us, so that fairly accurate field observations were possible, and yet they were flitting about so constantly in search of insect life, which was very abundant on the sunny edge of the swamp, that it was almost impossible to get a good shot at any of them. The depth of the water between the swampy islands also impeded us greatly.

Our conclusions in regard to the birds we did not secure, were as follows: one adult bird was certainly present and that was a pure male Golden-winged Warbler. This bird, though not actually observed feeding the young, was with them at all times, sometimes occupying the same branch with them and exhibiting the subtle behavior of a parent bird. If the other parent was present, we could not distinguish it from the young. It should be stated, however, that a Blue-winged Warbler, sex undetermined, had been noted in the neighborhood not a hundred feet away, but this bird was constantly associated with other warblers and was not once seen with the hybrid family in question. As to the color of the other young birds, I noticed particularly that they were all very light, especially on the under parts. One of them had a more pronounced, dusky throat than the others, and none of them seemed to have the under parts suffused with yellow, as did the specimen secured. And yet they might have had, as the character of under parts is very difficult to determine in the field, even when birds are as close as these were.

It was most unfortunate that we were chased away by an excited farmer, otherwise we might have contributed something more definite to the store of knowledge gradually accumulating about these interesting species.

The specimen was mailed to Dr. Witmer Stone at the Academy of Natural Sciences, Philadelphia. Unfortunately it arrived in such bad condition that it could not be preserved, but before it was thrown away, it was

carefully compared with specimens in the Academy's collection. Dr. Stone stated that it was undoubtedly one of the hybrid warblers, and that it was somewhat similar to a specimen in the collection marked *leuco-bronchialis*.—ROBERT THOMAS MOORE, *Haddonfield, N. J.*

Cape May Warbler in Virginia in Winter.—On December 7, 1915, about 8:00 P.M., a Cape May Warbler (*Dendroica tigrina*) was brought to me alive but in a much weakened condition. According to the captor of the specimen, it was secured in the morning, in the snow, being barely able to flutter along. It revived considerably when taken to warmer quarters, but refused to eat. On the morning following it seemed even better, and ate banana from the hand. It rejected peanuts, but ate the banana readily. By the following evening it seemed weaker, however, and the next morning it was dead. The bird was apparently a young male, and with the exception of the fact that it had but three tail feathers, the plumage was comparatively perfect.—GEORGE M. SUTTON, *Bethany, W. Va.*

The Occurrence of the Western House Wren on Smith's Island, Northampton County, Virginia.—On May 13, 1910, I collected an adult male of *Troglodytes aëdon parkmani* at Smith's Island, Northampton County, Virginia. The specimen is Cat. No. 312912, U. S. National Museum. (Original number, 18946.) It was identified by Messrs. Ridgway, Oberholser, and Mearns.—EDGAR A. MEARNs, *Washington, D. C.*

Bicknell's Thrush in Northeastern Illinois.—On September 6, 1909, while collecting migrating warblers in the woods near Highland Park I shot a rather small specimen of *Hylocichla aliciae*, which on more careful examination proves to be a typical example of *Hylocichla aliciae bicknelli*. It is an adult male (H. K. C. No. 13169), and measured before skinning: length 7 in., extent 11.5 in., wing 3.75 in., tail 2.70 in. The average measurements of several males of *Hylocichla aliciae aliciae* in my collection are: length 7.5 in., extent 13 in., wing 4.25 in., tail 3.25 in. The only other record for the state is a specimen taken by Charles K. Worthen at Warsaw, May 24, 1884 (Ridgway, Orn. Ill. 1889).—HENRY K. COALE, *Highland Park, Ill.*

Additions to the Birds of Custer County, Montana.—In the months of November and December, 1909, I spent some time in the extreme southeastern part of Custer County, Mont., close to the South Dakota border. During this time I found three species of birds not included in the late Mr. E. S. Cameron's list of the Birds of Custer and Dawson Cos. (Auk, Vol. XXIV, p. 241 to 270 and 389 to 406. Vol. XXV, p. 39 to 56.) I sent these records to Mr. Cameron, who wrote me that he intended to publish some additions to his list later, and would include them then. Since the recent death of Mr. Cameron prevented the publication of these additions, I have decided to put them on record myself.

During the past summer I had an opportunity to examine the collection of birds at the University of Montana. In this collection I found a large number of specimens from Miles City and vicinity, taken by Mr. C. F. Hedges. Two of the birds I had observed were represented and a number more as well that are new to the region, including one that is entirely new to the State. In addition to this I have found a number of Mr. Hedges' specimens in the collection of Dr. L. B. Bishop at New Haven. The combination of these records presents sixteen species new to the region, as well as some other notes of interest on species that are not new.

Nuttallornis borealis. OLIVE-SIDED FLYCATCHER.—One male, Miles City, June 8, 1902.

Otocoris alpestris arcticola. PALLID HORNED LARK.—One male, Miles City, March 30, 1901.

Astragalinus tristis pallidus. WESTERN GOLDFINCH.—Comparing Mr. Hedges' specimens with Connecticut specimens in the same collection, I believe that they belong to the western race. One specimen taken at Miles City, December 25, 1899, makes the first winter record from this region.

Calcarius lapponicus alascensis. ALASKA LONGSPUR.—A specimen in Dr. Bishop's collection was taken at Miles City, September 24, 1900. A series of this species in the University of Montana collection, taken from September 20 to 27, 1900, probably also belong to this race, though they are labelled 'Calcarius pictus.'

Spizella pusilla arenacea. WESTERN FIELD SPARROW.—One, Miles City, May 11, 1902.

Junco aikeni. WHITE-WINGED JUNCO.—A series of ten specimens taken at Miles City between April 22 and 27, 1900. I found this bird in the Long Pine Hills, and secured a specimen December 5, 1909. Mr. S. S. Visher also found it breeding in this region July 20, 1910. (Auk, XXVIII, p. 14.)

Junco hyemalis connectens. SHUFELDT'S JUNCO.—One specimen, Miles City, January 15, 1900.

Melospiza melodia montana. MOUNTAIN SONG SPARROW.—One female, Miles City, September 27, 1900. There are also several specimens of *M. m. melodia* from the region with which to compare this bird, which is markedly grayer in plumage.

Melospiza georgiana. SWAMP SPARROW.—One female, Miles City, February 17, 1901. Though there are two other records of this species from Montana, this is the first from this region, and the first that can be accepted without question.

Piranga ludoviciana. WESTERN TANAGER.—One female. Ft. Keough, June 1, 1902.

Stelgidopteryx serripennis. ROUGH-WINGED SWALLOW.—One male, Miles City, May 30, 1902.

Mniotilta varia. BLACK-AND-WHITE WARBLER.—One male, Miles City, May 21, 1902. This is the first record of this species for the State.

Dendroica auduboni. AUDUBON'S WARBLER.—Four specimens. Three from Little Pumpkin Creek, April 23, 26 and 27, 1900, and one from Ft. Keough, May 25, 1902.

Oporornis tolmiei. MACGILLIVRAY'S WARBLER.—One male, Ft. Keough, May 25, 1902.

Wilsonia pusilla pileolata. PILEOLATED WARBLER.—One specimen in Dr. Bishop's collection, September 22, 1900.

Sitta canadensis. RED-BREASTED NUTHATCH.—Seven specimens. Little Pumpkin and Otter Creeks, April 25-27, 1900, and one from Ft. Keough, May 18, 1902. I observed several of these birds in the Long Pine Hills, November 16, 1909.

Regulus satrapa (subspecies?). GOLDEN-CROWNED KINGLET.—I observed two of these birds in the Long Pine Hills, November 29, 1909.

Regulus calendula calendula. RUBY-CROWNED KINGLET.—One male, Ft. Keough, September 22, 1900.—ARETAS A. SAUNDERS, *West Haven, Conn.*

The Rose Beetle Poisonous to Young Birds.—In 1914, Mr. Ernest Napier, President of the New Jersey Fish and Game Commission reported to the Biological Survey the loss of hundreds of pheasant chicks and of numerous young ducks and chickens from eating rose beetles (*Macrodactylus subspinosus*). Four young Ring-necked Pheasants were examined and rose beetles found to compose 48, 30, 50 and 17 per cent respectively of their food. The largest number of rose beetles in any one was 12. The crops of these birds were only from one-fourth to three-fourths full and thoroughly ground up remains of the beetles were present in each gizzard, showing that the insects were being digested in regular course. There being no evidence of crop binding, to which the trouble had been attributed,¹ and a positive diagnosis of white diarrhoea being obtained, it was concluded that the rose beetles were not the direct cause of the mortality.

It is of great interest, therefore, that the rose beetle has recently been discovered to "contain a neuro-toxin that has an effect upon the heart action of both chickens and rabbits and is excessively dangerous as a food for chickens."² In experimental feeding of rose beetles to young chicks death resulted in from 9 to 24 hours. Similar results were obtained with an extract of rose chafers. Resistance to the poison increased rapidly with the age of the chicks and none over ten weeks old was killed.

Besides the obvious economic aspect of this discovery, and the indicated necessity of keeping young domesticated birds away from rose-beetles, the facts have an interesting bearing on the theory of "protected" insects and their warning colors. This, a poisonous insect according to the theory

¹ Prof. F. E. L. Beal informs the writer that it is sometimes necessary to open the crops of young turkeys because of clogging up by rose bugs.

² Lamson, George H., Jr.—The poisonous effects of the rose chafer upon chickens. *Journ. Ec. Ent.*, 8, No. 6, Dec., 1915, p. 548; *Science*, N. S., 43, Jan. 28, 1916, p. 139.

should have bright warning colors, yet is of a uniform and inconspicuous brownish yellow. According to hypothesis, furthermore, birds are supposed to learn about disagreeable insects when young and thus be trained when adult to ignore them. In this case, however, experiment is usually followed by death, so that experience is not conserved. What is more, the insect is not dangerous to adult birds, so that, adopting this style of argument for the moment, early bad experience probably would be overcome by later satisfactory trials.

We do not know whether eating rose chafers has a bad effect upon the young of wild birds, but we do know that the adults of a number of species feed upon these insects. So far, rose-beetles have been found in stomachs of 12 wild species. The Kingbird seems especially fond of them, from 12 to 40 rose-chafers being found in each of several collected stomachs.

The case is analogous to that of numerous birds feeding extensively upon the fruits of poison sumacs. A known poisonous principle, which at first thought we should be inclined to consider a preventive against eating by wild animals, is proved by the observed facts to have no such effect. Other analogies are by no means rare, and it would seem that if carefully pondered, they would serve to check the enthusiasm with which anthropomorphic explanations of animal behavior are advanced.—W. L. MCATEE, *Washington, D. C.*

A Fossil Feather from Taubaté.—Fossil birds are rare enough when we come to consider how very few of them have fallen into the hands of science, as compared with the great quantity of material we have representing the fossil forms of other Vertebrata; and, as to fossil feathers, they are many times rarer than those of the birds themselves. Without inviting special attention to the literature on this subject—for numerous authors have contributed to it, myself among the number—I would say that the specimen here to be described was kindly sent me for that purpose by Herr Director Dr. von Ihering, of the Museu Paulista, São Paulo, Brazil; it came by registered mail, the letter of transmittal being dated January 8, 1915.

The locality where this specimen was found has yielded many fine fish fossils, which have been described by Dr. A. S. Woodward, of the British Museum, while the locality itself has been touched upon by Dr. von Ihering himself in an article entitled: 'Observações sobre os peixes fósseis de Taubaté,' which appeared in volume iii (p. 71) of the 'Revista do Museu Paulista' for the year 1898. As the locality is fully described in that contribution, it will not be necessary to further refer to it in this note.

The matrix is of dark chocolate brown, with a leathery roughness on the side carrying the fossil; on the other side it is somewhat lighter in color, and exhibits evidences of cleavage horizontally. In size the slab measures about 14 cm. by 7.5 cm., and it has an average thickness of 3 mm. It bears evidence of having been cut out of its place where collected with some sharp instrument—perhaps a strong knife. As noted above, the specimen

contained in this matrix is upon its dark side, and is, without doubt, the feather of some rather large bird. When the slab is wet, this feather comes out much more clearly into view, and when it was in that condition, I made a photograph of it natural size, to file, along with similar ones, in my collection.

Although this fossil feather has the appearance of being somewhat plumulaceous in character, I am strongly of the opinion that it is a primary feather from a wing. Its quill has a length of about 4 cm., and the vane about 7.3 cm. In other words, it was a feather about 11.3 cm. long, and apparently belonged to a bird of considerable size. As the photograph shows, the impression is very faint, and even with a strong lens it is quite impossible to make out the minute structure or any part of it, as is so frequently the case in fossil feathers. This specimen is No. 111 in the Paulista Museum, and is of interest from the fact that it furnishes evidence of the existence of highly developed birds in that particular formation in which it occurred.—R. W. SHUFELDT, *Washington, D. C.*

RECENT LITERATURE.

Bryan's Natural History of Hawaii.¹—Quoting the words of the author in his preface: "In the preparation of the following pages it has been the aim of the author to bring together into one volume the more important and interesting facts about the Hawaiian Islands and their primitive inhabitants, as well as information concerning the native and introduced plants and animals of the group."

The results of the author's labors appear in a large volume of nearly 600 pages, illustrated by 117 full-page plate photographs. The scope of the volume and the subjects treated appear from the following chapter headings:

Coming of the Hawaiian Race; Tranquil Environment of Hawaii and its Effect on the People; Physical Characteristics of the People; Their Language; Manners and Customs; Religion of the Hawaiians; Their Method of Warfare and Feudal Organization; The Hawaiian House: Its Furnishings and Household Utensils; Occupations of the Hawaiian People; Tools, Implements, Arts and Amusements of the Hawaiians; Coming of Pele

¹"Natural History of Hawaii." Being an Account of the Hawaiian People, the Geology and Geography of the Islands, and the Native and Introduced Plants and Animals of the Group. By William Alanson Bryan, B. Sc., Professor of Zoölogy and Geology in the College of Hawaii. The Hawaiian Gazette Co., Ltd., 1915. Price, \$5.50.

and an Account of the Low Islands of the Group; The Inhabited Islands; A description of Kauai and Niihau; Island of Oahu; Islands of Molokai, Lanai, Maui and Kahoolawe; Island of Hawaii; Kilauea, the World's Greatest Active Volcano; Condensed History of Kilauea's Activity; Plant Life of the Sea-shore and Lowlands; Plant Life in the High Mountains; A Ramble in a Honolulu Garden; Tropical Fruits in Hawaii; Agriculture in Hawaii: Its Effect on Plant and Animal Life; Various Animals from Land and Sea; Introduced Birds; Birds of the Sea; Birds of the Marsh, Stream and Shore; Birds of the Mountain Forests; Hawaiian Fishes; Introduced Fresh Water Fish; Important Economic Insects; Native Insects; Land and Fresh Water Shells; Shells from the Sea-shore; Plants and Animals from the Coral Reef.

The long residence of the author in the archipelago, his extensive knowledge of biological subjects, and his sympathetic acquaintance with the natives and their ways eminently fit him for his self-imposed task, and the result is a volume which cannot fail to be of great value to the general student of island history, the visitor who seeks for information and an explanation of what he sees about him, and for the residents. Hitherto much of the information in regard to the islands and the natives, especially on scientific subjects, has been locked up in special treatises not accessible to the general public, or in expensive volumes out of reach of all but the wealthy.

Readers of 'The Auk' will be chiefly interested in the chapters on birds, which fill pages 304 to 338, and contain brief accounts, but no formal descriptions, of many of the islands' native birds and also the seven introduced species; English Sparrow, Rice Bird, Chinese Turtle-dove, Mynah, Sky-lark, Pheasant, and California Partridge.

Under the caption Birds of the Sea and Oceanic Islands the author treats of many of the more interesting species permanently residing on the islands or spending the winter on them. Under this head are included also the Laysan Islands birds, which are of special interest to the ornithologist.

Under the caption 'Birds of the Mountain Forests' are mentioned the more notable of the native woodland birds, including the famous and now extinct Mamo, and the O-o.

American ornithologists will hardly be able to understand the statement that were it not for the presence of a dozen or more species of birds that have been introduced into Hawaii by accident or design, it is doubtful if the average tourist would see or hear a single bird during his journeys through the islands. Nevertheless, the statement is literally true, so closely are the native species confined to the deep forests and steep mountain-sides and so difficult of access are these semi-tropical fastnesses.

Recalling the roving disposition of our mainland crows, the American ornithologist will be surprised to learn that the Hawaiian Crow (*Corvus hawaiiensis*) is restricted to a part of one island, and not only has failed to occupy the other islands of the group, but fails to enter even the neighboring districts where vegetation is similar and food appears equally abundant.

Even more remarkable is the case of one of the *Drepanine* birds, *Viridonia sagittirostris*, which is confined to a tract of the deep forests in Hawaii a few miles square, although the surrounding forest seems to be in every respect similar.

Seven black-and-white plates fairly well illustrate the more interesting of the Hawaiian birds. As many of these birds are beautifully colored, it seems a pity that adequate illustrations in color could not have been furnished. The accounts of the Hawaiian birds, while not written for the professional ornithologist, contain many facts of interest and give an excellent birds-eye-view of the subject. The non-professional, however, for whom the accounts of the islands birds are chiefly intended, will find the treatment given by the author entirely adequate to his needs. The index and glossary to the volume have been made a special feature. They have been prepared with great care, and render the contents of the book readily accessible to every seeker for the wealth of material which it contains.—H. W. H.

The B. O. U. Jubilee Supplement to the Ibis, No. 2.¹—In December, 1908, the British Ornithologists' Union, as part of the activities connected with the celebration of its fiftieth anniversary, arranged to send an expedition to Dutch New Guinea to explore the Snow Mountains, with especial consideration of its avifauna. This expedition under the leadership of Mr. Walter Goodfellow met with unforeseen obstacles and while it acquired much valuable information and many specimens, it failed to accomplish all that was hoped for. The ornithological results appeared in 'The Ibis' for 1913, pp. 76-113.

A second expedition, under Mr. A. F. R. Wollaston, who had accompanied the first one, met with complete success, reaching the highest peaks of the Snow Mountains and bringing back large collections. The present report covers both collections—representing 321 species and includes additional forms obtained by other expeditions. It contains a vast amount of information upon the relationship and status of the birds of this portion of New Guinea which could only be obtained from adequate series of specimens such as are here available. Many important facts regarding the plumage of Birds of Paradise are brought out for the first time.

As might have been expected, Bowdler-Sharpe's statement that the glossy green racket shaped tail feathers of the King Bird of Paradise are apparently derived from the curved brown ones without molt, proves to be erroneous. The green racket shaped feathers are acquired in the fourth year by a regular molt, encased in curious circular sheaths "for all the world like miniature motor-tyres." There are also numerous valuable field

¹The Ibis, Jubilee Supplement No. 2. 1915. Report on the Birds collected by the British Ornithologists' Union Expedition and the Wollaston Expedition in Dutch New Guinea. By W. R. Ogilvie-Grant. pp. i-xx + 1-336, 8 plates and two maps. December, 1915.

notes by the members of the expedition which add much to our knowledge of the habits of the birds of this wonderful country.

Many new forms have already been described from these collections, but others, recognized as the critical study of the material progressed, are here described for the first time. These are: *Cicinnurus regius claudii* (p. 16); *Lophorhina superba feminina* (p. 27); *Ptilotis salvadorii utakwensis* (p. 71); *Pachycephala soror klossi* (p. 88); *Lalage karu microrhyncha* (p. 118); and *Pseudogerygone conspicillata mimikae* (p. 168). New forms described from other parts of New Guinea or elsewhere are as follows: *Diphyllodes rothschildi* (p. 24), Salawatti; *Pachycephala soror bartoni* (p. 88), British New Guinea; *Rhipidura harterti* (p. 149), Rendova, Solomon Is.; *Poecilodryas brachyura dumasi* (p. 162), Northern New Guinea; *Microeca griseiceps bartoni* (p. 174), Mt. Manacao; *Alcyon richardsi aolae* (p. 206), Aola, Guadalcanar, Solomon Is.; *A. r. bougainvillei* (p. 207), Bougainville, Solomon Is.

Mr. Ogilvie-Grant has evidently spared no pains to make his report as full and accurate as possible and he has succeeded in producing one of the most valuable contributions to the ornithology of New Guinea that has yet appeared. With so many points of excellence to its credit it is regrettable to find the old custom perpetuated of designating two types — a male and female. In case these should eventually prove to belong to different forms — and such things have occurred! — we immediately have an opportunity for a nomenclatural entanglement, which would have been entirely avoided by designating but one type specimen. — W. S.

Chapin on New Birds from the Belgian Congo.¹— Continuing the critical study of the collection obtained by the American Museum Congo Expedition, Mr. Chapin describes four new species. These are a Starling, *Stilbopsar leucothorax* (p. 23), from the Ituri District; *Paludipasser uelensis* (p. 24), from the Upper Uele District, a curious Weaver Finch, apparently congeneric with Mr. S. A. Neave's *Paludipasser locustella* from Lake Bangweolo; another Weaver, *Malimbus flavipes*, (p. 27), Ituri District and a warbler, *Bradypterus carpalis* (p. 27), from the papyrus swamps of the Upper Uele. Drawings of head and feet accompany the excellent descriptions and a few remarks on habits are added, forming a welcome relief from the all too prevalent meagre diagnoses which characterize many present day systematic papers. — W. S.

Oberholser on Races of the Crested Tern.²— This is another of Mr. Oberholser's careful monographs, treating of a group that has recently

¹ Four New Birds from the Belgian Congo. By James P. Chapin. Bull. Amer. Mus. Nat. Hist., XXXV, Art. III, pp. 23-29. February 21, 1916.

² A Synopsis of the Races of the Crested Tern, *Thalasseus bergii* (Lichtenstein). By Harry C. Oberholser. Proc. U. S. Nat. Mus., Vol. 49, pp. 515-526, Plate 66. December 23, 1915.

received considerable attention from authors, notably Mr. Mathews and Mr. Stresemann. As Mr. Oberholser's material was not available to either of these authors his investigations have a peculiar value in checking up their conclusions.

Eleven races are recognized, all but one of which fortunately are already provided with names. This form from Pata Island, southern Philippines, is described as *Thalasseus bergii halodramus* (p. 522). Mr. Bang's race *boreotis* from the Riu Kiu Islands is synonymized with *T. b. cristatus*.

While there may be a difference of opinion as to the advisability of raising *Thalasseus* to full generic rank it is a satisfaction to see this name used for this group instead of for the Caspian Tern as is done in the A. O. U. Check-List, a mistake against which the reviewer has long contended. Mr. Oberholser's statement regarding one form of which he was unable to see specimens is significant. He says, "there is no trouble at all in distinguishing it... merely from the measurements given by Mr. Stresemann." Had Mr. Stresemann neglected to give measurements as has been done in some recent diagnoses of new forms, the status of this race could not have been settled in the present monograph!—W. S.

Riley on a New Hazel Grouse.¹—The United States National Museum having recently acquired a series of typical *Tetrastes bonasia septentrionalis* Mr. Riley finds that specimens from Manchuria formerly referred to that form are quite distinct and he proposes for them the name *T. b. amurensis* (p. 17), type locality I-mien-po, N. Kirin.—W. S.

McGregor on a New Prionochilus.²—This new flower-picker which is here named *Prionochilus anthonyi* (p. 531) was procured on Polis Mountain, Luzon, in the mossy forest at 2000 ft. elevation. It differs in pattern of coloration from any other Philippine species. A colored plate accompanies Mr. McGregor's paper.—W. S.

Chapman on New Colombian Birds.³—Dr. Chapman here proposes twenty-five new species and subspecies as a result of his further studies of the collections of the American Museum. As in his previous papers the descriptions are accompanied by extended remarks on allied forms which add materially to our knowledge of the groups treated. The new forms here described belong to the following genera, *Crypturus*, *Tachytriorchis*, *Herpetotheres*, *Aulacorhynchus*, *Picumnus*, *Conopophaga*, *Microbates*, *Xiphorhynchus*, *Siptornis*, *Automolus*, *Manacus*, *Phyllomyias*, *Habrua*, *Microcerculus*,

¹ Description of a New Hazel Grouse from Manchuria. By J. H. Riley. Proc. Biol. Soc. Wash., XXIX, pp. 17-18. January 25, 1916.

² Description of a New Species of Prionochilus from the Highlands of Luzon. By Richard C. McGregor. Philippine Jour. of Sci., IX, No. 6, Sec. D. November, 1914.

³ Diagnoses of Apparently New Colombian Birds., IV. By Frank M. Chapman. Bull. Amer. Mus. Nat. Hist., XXXIV, Art. XXIII, pp. 635-662. December 30, 1915.

Poliophtila, *Sporophila*, *Calamena*, *Phrygilus*, *Cyanerpes*, *Iridosornis*, and *Cacicus*. The northern races of *Phrygilus unicolor* are considered at length.—W. S.

Coale on the Birds of Lake County, Ill.¹—The separate before us constitutes Chapter XIV of a history of Lake County published in 1912, pp. 353-370, although this fact does not appear on the cover. It consists of a list of 269 species with brief annotations and records of rare occurrences and forms a very satisfactory county list.—W. S.

Roberts' 'The Winter Bird-Life of Minnesota.'²—This brochure is Dr. Roberts' first publication since occupying the position of ornithologist in the department of animal biology in the University of Minnesota and of the Natural History Survey. It is an excellent summary of the winter bird life of Minnesota, illustrated by a number of half-tones from photographs and a colored plate of the Evening Grosbeak. The species are grouped under the following heads, Permanent Residents 35; Winter Visitors 17; "Half Hardy" 12; Accidental 27, while in a summary at the end they are all arranged systematically in one nominal list. It would seem that the reverse of this method would render the list more easy of consultation, as it is much easier to find a species in a single list than to hunt for it in four, while nominal lists under the above headings could be better contrasted. However this may be a matter of opinion and in no way detracts from the excellence of Dr. Roberts' work. He has brought together a mass of valuable data and his list should be of much assistance to the ornithologist, the Audubon Society and the conservationist. The same paper without the summary and colored plate appeared a few weeks earlier in 'Fins, Feathers and Fur,' the official bulletin of the Minnesota Game and Fish Department, for December, 1915.—W. S.

Kellogg's Report upon Mammals and Birds of Trinity, Siskiyou and Shasta Cos., Cal.³—This report deals with the results of two trips into the Trinity, Salmon and Scott Mountains of northern California undertaken during February-March, and June-August, 1911, by Misses Annie M. Alexander and Louise Kellogg. A collection of 449 birds and 976 mammals was obtained which has been presented by Miss Alexander to the Museum of Vertebrate Zoology of the University of California. The greater part of the report treats of the mammals, but there is a briefly annotated list of the birds, with dates and localities where they were observed. This comprises 95 species.

¹ *Birds of Lake County*. By Henry Kelso Coale. [1912].

² *The Winter Bird-Life of Minnesota*. Being an annotated list of birds that have been found within the State of Minnesota during the winter months. By Thomas S. Roberts, M. D. Geol. and Nat. Hist. Survey of Minn. Zool. Div. Occasional Papers: Number 1, pp. 1-20, pl. 1. February, 1916.

³ *Report upon Mammals and Birds found in Portions of Trinity, Siskiyou and Shasta Counties, California*. By Louise Kellogg. Univ. of Cal. Publ. in Zool., Vol. 12, No. 13, pp. 335-398, plates 15-18. January 27, 1916.

Another paper by Dr. Joseph Grinnell immediately follows Miss Kellogg's and deals with an 'Analysis of the Fauna of the Trinity Region of Northern California'¹ based upon the collection above mentioned. His conclusions are that the boreal element of the fauna of the Trinity region is nearest to that of the Sierra Nevada, with but little Humid Coast element, while the Sonoran "islands" of the region are nearest to the Sacramento Valley in their faunal characteristics. The Trinity region seems to show but very slight endemic individuality. These two papers form a valuable contribution to the series which Dr. Grinnell and his associates are issuing from time to time and which are rapidly assuming the proportions of a natural history survey of the State.—W. S.

Lincoln's 'The Birds of Yuma County, Colorado.'²—This is a very briefly annotated list of 164 species. Presumably it is based upon field work carried on by representatives of the Colorado Museum of Natural History but on this point the several paragraphs of introduction throw no light, merely stating that systematic work in Yuma county "was deemed likely to be exceptionally productive." It is to be regretted that some account of the expedition and a detailed analysis of its results do not accompany the list.—W. S.

Witherby's Report on the 'British Birds' Marking Scheme.³—During the seven years that 'British Birds' has been conducting its systematic bird marking scheme, 67,614 birds have been banded. Of the 59,847 banded to the end of 1914 no less than 1835, or 3.06 per cent, have been heard from. Several Swallows, a Sand Martin and a Wryneck banded in 1914 returned to England and were identified the following year, while a Martin banded at Kinnelhead June 26, 1913, was recovered at the same place August 17, 1915. Three Mallards banded in Great Britain in February were recovered in Sweden and Holland, in November and August following.

These are only some of the interesting records which this report contains, and it is deeply to be regretted that the war is so seriously interfering with the progress of this valuable line of ornithological work.—W. S.

Recent Papers by Van Oort.—Several recent publications by Dr. E. D. Van Oort are before us. In one he summarizes the work of the Leiden Museum in bird banding,⁴ giving some 47 cases of birds recovered

¹ An Analysis of the Vertebrate Fauna of the Trinity Region of Northern California. By Joseph Grinnell. Univ. of Cal. Publ. in Zool., Vol. 12, No. 14, pp. 399-410. January 27, 1916.

² The Birds of Yuma County, Colorado. By F. C. Lincoln. Proc. Colo. Mus. Nat. Hist., pp. 1-14, Dec., 1915. [Neither volume nor part indicated].

³ The "British Birds" Marking Scheme. Progress for 1915 and Some Results. By H. F. Witherby. British Birds, IX, No. 9. February 1, 1916.

⁴ Resultaten van het ringonderzoek van het Rijks Museum te Leiden. Ardea, 1915, pp. 119-126.

in 1914 and 1915. These include representatives of a number of different species, Gulls, Titmice, Starlings, etc. In another paper¹ he records the occurrence of *Puffinus gravis* in the Netherlands for the first time while a third contribution² consists of a description of a new Bird of Paradise, *Falcinellus meyeri albicans* (p. 228) from the Snow Mountains of Central New Guinea.—W. S.

Didier's 'Le Macareux du Kamtschatka.'³—This brochure consists of a brief monograph of the Crested Puffin, with descriptions of birds in various stages of plumage, accounts of nest, egg, habits, distribution, synonymy, etc. There is also a lithographic plate of the adult birds and a cut of the egg.—W. S.

Annual Report of the National Association of Audubon Societies for 1915.⁴—This report shows the National Association, the 'parent body' of bird protectionists in America, to be in excellent condition. About \$100,000. of income has been expended during the year in the interests of wild bird life. Besides the secretary's report which touches briefly upon the various lines of work carried on during the year, we have reports of field agents, in Maine, Massachusetts, Virginia, Ohio and the Pacific States; the report of H. K. Job, head of the department of Applied Ornithology, of Mary S. Sage, organizer in schools, and thirty-nine reports from State Societies and independent clubs. In conclusion there is the report of the treasurer and the list of members. This report as well as the substantial Audubon department in each number of 'Bird-Lore' will prove interesting reading to all who have at heart the growth and development of the great work of bird protection.—W. S.

Recent Bird Biographies by Miss Stanwood.—Numerous sketches of birds and their nesting activities have appeared during the last few years from the pen of Miss Stanwood, all of them evidently based upon careful study and written in a style that is pleasing and yet serious enough to suit the importance of many of the facts that are recorded. These sketches can well be taken as models for others who have the time to make careful studies of the activities of birds' nests, and ability to set them down in biographical sketches. Miss Stanwood has recently contributed an excellent account of the nesting of the Red-breasted Nuthatch,⁵ a species that but

¹ Een voor de Nederlandsche fauna nieuwe stormvoglesoort *Puffinus gravis* (O'Reilly) Ardea, 1915, pp. 130-131.

² On a New Bird of Paradise from Central New Guinea, *Falcinellus meyeri albicans*. Zool. Mededeelingen, Deel I, Afl. 3-4.

³ Le Macareux der Kamtschatka (*Lunda cirrhata* (Pall.)) Dr. Robert Didier. Suppl. au No. 82 de la Revue Française d'Ornithologie. 1916. pp. 1-16. Pl. I.

⁴ Annual Report of the National Association of Audubon Societies for 1915. Bird-Lore, 1915, pp. 493-560.

⁵ The Red-breasted Nuthatch. By Cordelia J. Stanwood. Home Progress, January, 1916, pp. 213-215.

few have had the opportunity to study carefully in its summer home, another on the nesting of the Redstart¹ and an account of a tame Olive-backed Thrush² which she raised from a nestling.—W. S.

Washburn's 'Further Observations on Minnesota Birds.'³—Minnesota birds bid fair to be well cared for in the future, for in addition to Dr. Roberts' list we have another circular from the Agricultural Experiment Station on common birds, by the State Entomologist, Mr. F. L. Washburn. This is issued in response to the great demand in the schools for a similar earlier publication (Circular 32). Twenty-three familiar species are described in a popular way and illustrated by cuts from 'Citizen Bird' representing paintings by Louis Agassiz Fuertes, which have been very well printed. Mr. Washburn's pamphlet should prove very satisfactory for school use.—W. S.

Recent Papers on Bird and Game Protection.—Dr. Walter P. Taylor⁴ at the Meeting of the American Association of Museums in San Francisco read an important paper, reviewing the carelessness of legislative bodies in passing laws affecting wild birds and animals which have operated toward the extinction of really valuable species. He then pointed out an important function of the museum in placing at the service of the State the results of its technical and economic investigations and in training experts who can work directly for the State in the investigation and conservation of the native fauna.

Two recent pamphlets from the Biological Survey are Mr. Henshaw's report as Chief of the Survey⁵ and the report of the governor of Alaska on the Alaska Game law.⁶ The bird work outlined by Mr. Henshaw has been largely published in special reports already noticed in these columns, and covers the mortality of wild ducks on Great Salt Lake; ducks in relation to oyster industry; food of wild ducks; collecting of data on migration and distribution; notes on conditions of ten national bird reservations are given and on the enforcement of the Migratory Bird Law. Importations of foreign birds total 270,000 for the year 1915, of which 216,000 were canaries. In Alaska the bag limit for game birds has been of great value in

¹ A Skillful Architect [The Redstart]. By Cordelia J. Stanwood. The House Beautiful, February, 1916. pp. xl-xlii.

² The Chronicle of a Tame Olive-backed Thrush. By Cordelia J. Stanwood. Wilson Bulletin, No. 93, December, 1915.

³ Further Observations on Minnesota Birds: their Economic Relations to the Agriculturist. By F. L. Washburn. Circular 35, Minn. Exper. Sta. January 15, 1916.

⁴ The Museum of Natural History and the Conservation of Game. By Dr. W. P. Taylor. Proc. Amer. Asso. of Museums, IX, pp. 96-103, 1915.

⁵ Report of Chief of Bureau of Biological Survey. By H. W. Henshaw. Ann. Rep. U. S. Dept. Agr., 1915, reprint, pp. 1-15.

⁶ Report of the Governor of Alaska on the Alaska Game Law. By J. F. A. Strong. pp. 1-18.

saving from extinction grouse, ptarmigan and water fowl in certain sections, while the law against spring shooting is generally respected.

The New Jersey Audubon Society has issued an attractive annual report,¹ devoted especially to the Junior Audubon class work.—W. S.

A Beginning of Philippine Economic Ornithology.—Mr. Richard C. McGregor, Ornithologist of the Philippine Bureau of Science has undertaken the study of the economic value of birds in the Philippines, in which work he has the support and coöperation of the Agricultural Congress. A circular requesting information has been issued, accompanied by a card upon which the data can be entered. There has been published also a press bulletin² intended to arouse interest in the work. This publication illustrates some common types of Philippine birds, and contains general notes on the food of many species, and specific data on a few.

It is to be hoped that good progress can be made on the elucidation of the economic ornithology of the Philippines, and that the results in rational protection of birds will be satisfactory.—W. L. M.

Collinge's 'Some Observations on the Rate of Digestion in Different Groups of Wild Birds.'—Under this caption, Professor Walter E. Collinge summarizes³ the investigations of other workers, and presents the results of his own studies on rate of digestion in the Rook, Starling, and House Sparrow. The various findings agree very well that the contents of the stomach are completely digested in about four hours. From this it would seem that the human plan of three meals a day must be largely prevalent among birds. The reviewer has presented evidence⁴ that a much larger number of meals may be taken when the food consists of particularly delicate insects.—W. L. M.

Economic Ornithology in Recent Entomological Publications.—In "Some notes on the western twelve-spotted . . . cucumber beetles,"⁵ Mr. R. A. Sell notes that "The only birds observed actually eating these insects were the purple finch, the bush-tit, the linnet and the canon wren."

The Biological Survey records add to this list: the Pipit, Wren-tit, Tule Wren, Red-shafted Flicker, Steller's Jay, Yellow Warbler, Western Yellow-bellied Flycatcher, Traill's Flycatcher, Brewer's Blackbird, Western Yellow-throat, Lutescent Warbler, Barn Swallow, Russet-backed Thrush, Bullock's Oriole, California Shrike, Valley Quail, Gambel's Quail, Cliff Swallow, California Towhee, Spurred Towhee, Black Phoebe, Vigor's Wren, and Black-headed Grosbeak. Some of these birds feed extensively

¹ Fifth Annual Report of the New Jersey Audubon Society. Oct. 5, 1915. pp. 1-23.

² No. 32, rev. Bureau of Science, 14 pp., Dec. 29, 1915. Birds in Their Economic Relation to Man.

³ Journ. Econ. Biol., Vol. X, No. 3, Sept., 1915, pp. 65-68.

⁴ Yearbook, U. S. Dept. of Agriculture, 1912 (1913) pp. 402-403.

⁵ Journ. of Economic Ent., Vol. 8, No. 6, Dec. 1915, p. 518.

on the beetle (*Diabrotica soror*). From Mr. Sell's account it appears that natural enemies other than birds are negligible.

A few birds that feed upon grasshoppers are mentioned in Harrison E. Smith's report on 'The Grasshopper outbreak in New Mexico, during the summer of 1913.'¹ The irruption described was largely of one species, the long-winged grasshopper (*Dissosteira longipennis*). It extended over about 500 square miles in which area grasses and crops were in great part devastated. "Among the more important bird enemies noted to be feeding upon grasshoppers during this invasion were the Desert Horned Lark (*Otocoris alpestris leucolæma*), Western Meadowlark (*Sturnella neglecta*), Desert Sparrow Hawk (*Falco sparverius phalæna*), Nighthawk (*Chordeiles virginianus*), Killdeer (*Oxyechus vociferus*), and Quail (*Colinus virginianus*)" (pp. 6-7).

A Woodpecker is given high credit as an enemy of a destructive pine moth by Josef Brunner of the Bureau of Entomology."² It is said that: "In most sections of the Rocky Mountains the Rocky Mountain Hairy Woodpecker (*Dryobates villosus monticola*) is unquestionably the most efficient natural force in restraining the Zimmerman pine moth. Thousands of trees are each year regularly infested by the moth in comparatively small areas, and this bird as regularly destroys almost all of the larvæ in all of them during early winter, so that, although hundreds of trees may be examined at a time, it is only on rare occasions that larvæ are found after December in wounds in the trunks of trees which had been infested during the previous summer. This woodpecker seems to have a decided preference for the caterpillar of the pine moth wherever the writer and the entomological rangers assigned to the Northern Rocky Mountain Field Station have had opportunities for observation. In the extreme southeastern part of Montana, and particularly that portion covered by the Northern Cheyenne Indian Reservation and by the Custer National Forest, the moth has apparently neither bird nor insect enemies. In all other localities this woodpecker is fully able to eliminate this insect as a serious factor in timber destruction. Especially will the work of the bird become effective when the habits of the moth are more generally understood and its "brood trees" are eliminated through use by man."

In recent papers by W. W. Froggatt, Government Entomologist of New South Wales, are some interesting notes on the food of birds. He discusses³ at some length the bird enemies of sheep-maggot flies (*Calliphora* spp.). The Crow (*Corvus coronoides*) is credited with destruction of large numbers of the maggots. Other birds recorded among their enemies are Magpies (*Gymnorhina*) and Soldier-birds and other Honey-eaters (*Meliphagidæ*). The writer adds a word of caution against indiscriminate spread of the Starling.

¹ Bull. No. 293, U. S. Dept. of Agr., 12 pp., 2 figs., Oct. 7, 1915.

² Bull. No. 295, U. S. Dept. of Agr., Oct. 28, 1915, p. 6.

³ Farmers' Bull. No. 95, Dept. of Agr., N. S. Wales, March, 1915, pp. 39-41.

In an article on 'Pests and disease of the cocoanut palm'¹ the same author notes that a small cockatoo of the Solomon Islands, which from the description is *Cacatua ducorpsi* (fide Alex Wetmore), does a great deal of damage by gnawing holes in small green cocoanuts.—W. L. M.

The Ornithological Journals.

Bird-Lore. XVII, No. 6. November–December, 1915.

The Behavior of the Least Bittern. By Arthur A. Allen.—Excellent illustrations from photographs.

A Family of North Dakota Marsh Hawks. By Florence M. Bailey.

Grouse Camp-Mates. By Roy C. Andrews.—Spruce Grouse in the Adirondacks.

The Nuthatches are the subject of the colored plate, with notes on migration and plumage of the several species.

The Educational Leaflet, by T. G. Pearson, treats of the Surf Scoter.

In the Audubon Society department there is a well illustrated article 'Cruising the Klamath.'

Bird-Lore. XVIII, No. 1. January–February, 1916.

Some Canadian Grouse. By H. H. Pittman.

The Chickadees are figured in the colored plate and their migration and plumage discussed.

Bird-Lore's Sixteenth Christmas Census covers 25 pages.

Educational Leaflet, The Shoveller. By T. G. Pearson.

The Condor. XVII, No. 6. November–December, 1915.

The Yellow-billed Loon, a Problem in Migration. By W. W. Cooke.

Notes on the Nesting of the White-tailed Ptarmigan in Colorado. By W. C. Bradbury.

Characteristic Birds of the Dakota Prairies. II. Along the Lake Borders. By Florence Merriam Bailey.

A Convenient Collecting Gun. By L. H. Miller.

Further Remarks on the Kern Red-wing. By J. Mailliard.

Nesting of the White-tailed Kite at Sespe, Ventura County, California. By Lawrence Peyton.

Additional Observations on the Birds of the Lower Colorado Valley in California. By A. B. Howell and A. Van Rossem.

The Condor. XVIII, No. 1. January–February, 1916.

Philadelphia to the Coast in Early Days, and the Development of Western Ornithology Prior to 1850. By Witmer Stone.

Characteristic Birds of the Dakota Prairies. III. Among the Sloughs and Marshes. By Florence Merriam Bailey.

New and Interesting Bird Records from Oregon. By S. G. Jewett.

¹ Science Bull. No. 2, Dept. Agr. N. S. Wales, 3d Ed., July 1914, p. 54.

A Personal Supplement to the Distributional List of the Birds of California. By W. L. Dawson.

The Wilson Bulletin. XXVII, No. 3. September, 1915.

Field Observations on the Rose-breasted Grosbeak. By I. N. Gabrielson.

Birds by the Wayside, in Egypt and Nubia. By Althea R. Sherman.

Owls as Regarded by the Scientist, the Agriculturist and the Sportsman. By R. W. Shufeldt.

Plainfield, New Jersey, Bird Census. By W. D. Miller and C. H. Rogers.

Mississippi Kite in Nebraska. By D. H. Bailey.

The Wilson Bulletin. XXVII, No. 4. December, 1915.

The Home of the Great Crest. By I. N. Gabrielson.

A Two-year Nesting Record in Lake County, Ill. By C. C. Sanborn and W. A. Gœlitz.— 71 species.

The Chronicle of a Tame Olive-backed Thrush. By C. J. Stanwood.

Five Hours on Butler's Lake, Lake Co., Ill. By W. A. Gœlitz.

Cardinals in Northeastern Iowa. By M. E. Hatch.

The Oölogist. XXXII, No. 12. December 15, 1915.

A Belated Nest of the Olive-sided Flycatcher. By R. W. Tufts.

Notes on the Acadian Flycatcher in the Vicinity of Philadelphia. By R. F. Miller.

The Oölogist. XXXIII, No. 1. January 15, 1916.

The Golden Eagle in Cochise County, Arizona. By F. C. Willard.

European Widgeon [in Virginia]. By H. H. Bailey.

The Oölogist. XXXIII, No. 2. February 15, 1916.

The Bald Eagle in Florida. By O. E. Baynard.

Blue Bird. VIII, No. 1. December, 1915.

A Sketch of the Magnolia Warbler on his Breeding Ground. By Cordelia J. Stanwood.— With illustrations from photographs.

Eggs of North American Water Birds. (Part iv). By R. W. Shufeldt.— Two color plates of Murre's Eggs.

Blue Bird. VIII, No. 2. January, 1916.

Some Experiences in the Photography of Owls. By R. W. Shufeldt.— Numerous illustrations.

Cemeteries as Bird Sanctuaries. By T. G. Pearson.— Reprinted from 'The Craftsman.'

The Ibis. X Series. Vol. IV, No. 1. January, 1916.

A Revision of the Genus *Haplopelia*. By D. A. Bannerman.— Ten forms are recognized, two subspecies of *H. larvata*, six of *H. simplex*, while *principalis* and *forbesi* are given specific rank. The latter, it is thought, will prove to be the female of another race of *simplex*, its locality being at present unknown.

Notes on some of the Birds of Grand Cayman, West Indies. By T. M. Savage English.— Twelve species are added to Mr. P. R. Lowe's list (*Ibis*, 1911). A colored plate of *Spindalis salvini*, *benedicti* and *pretrei* is given.

Notes on the Birds of the Jhelum District of the Punjab. By Hugh

Whistler. With Notes on the Collection by C. B. Ticehurst.— 267 species listed, of which *Riparia riparia indica* (p. 70) from Jhelum, is described as new.

Notes on a remarkable Honey-eater (*Woodfordia superciliosa* North.) from Rennell Island in the Western Pacific. By C. M. Woodford.— With colored plate.

Studies on the Charadriiformes — III. Notes in Relation to the Systematic Position of the Sheath-bills (*Chionididae*). By P. R. Lowe.— This is an admirably prepared paper on an important subject. Dr. Lowe's studies lead him to the opinion that the Sheath-bill is not a connecting link between the Plovers and Gulls as Kidder and Coues suggested, while it does not seem to be very closely related osteologically to the Oystercatcher as some writers have contended. He finds not a particle of evidence to support Dr. Shufeldt's statement that "the skull of *Chionis minor* is a veritable columbo-gallinaceous one." Dr. Lowe considered that the evidence points to the Sheathbills having been differentiated from the main Charadriiform stock before it had split into the Plover and Snipe branches and prior to the differentiation of the Skuas and Gulls. They are however, a very specialized, not a generalized, group.

Incidentally Dr. Lowe emphasizes the "very literal and patent fact" that the Gull is only a highly specialized Plover.

Bulletin of the British Ornithologists' Club. No. CCX. December 3, 1915.

Dr. Hartert described *Stachyris leucotis goodsoni* (p. 7), Borneo; and proposed the generic name *Reinarda* (p. 7) for *Claudia* preoccupied.

Egialitis hiaticula tundræ (p. 7) is described as new by Dr. P. R. Lowe from the valley of the Yenesei, E. Siberia; and *Mirafraga cantillans williamsoni* (p. 9) by E. C. Stuart Baker from Bangkok, Siam.

A general discussion was held on 'The Bearing of Oölogy on Classification.'

Bulletin of the British Ornithological Club. No. CCXI. December 20, 1915.

E. C. Stuart Baker described as new *Mirafraga assamica marionæ* (p. 34), from Central Siam, and Dr. Hartert the following: *Malacocincla sepiaria tardinata* (p. 35), Gunong Tahan, E. Malay Peninsula; *Pomatorhinus schisticeps cryptanthus* (p. 35), Margherita, Upper Assam; *Erythrocichla bicolor whiteheadi* (p. 36), Borneo; and *Macronus ptilosus reclusus* (p. 36), Kina Balu, Borneo. It was announced that the Birds of Paradise introduced on the island of Tobago in 1909 had bred, and five young had been raised.

Bulletin of the British Ornithologists' Club. No. CCXII. February 3, 1916.

Charles Chubb described the following new forms from Ecuador; *Asio galapagoensis æquatorialis* (p. 46), Pichincha; *Ciccaba albitarse goodfellowi* (p. 46), Quito; *Pyrrhuloxia castanopterus* (p. 47), Braza; *Grallaria nuchalis obsoleta* (p. 47), Pichincha; *Automolus brooki* (p. 48), Guala. G. M.

Matthews described *Cookkilaria cookii byroni* (p. 48) from Byron Bay, northern N. S. Wales.

A discussion was held on 'Bird Parasites and Bird Phylogeny.'

British Birds. IX, No. 7. December 1, 1915.

Notes on the Grey Plover on the Yenesei. By Maud D. Haviland.

The Moults of the British Passeres with Notes on the Sequence of their Plumages. Part II. By H. F. Witherby.—This installment treats of the Fringillidæ. Part III covering the same family appears in No. 8.

British Birds. IX, No. 8. January 1, 1916.

Henry E. Dresser, An obituary notice by Lord Rothschild.

Some Birds New to the British List. Notes by several contributors.

British Birds. IX, No. 9. February 1, 1916.

The "British Birds" Marking Scheme. By H. F. Witherby (see p. 213).

Notes on the Lapland Bunting on the Yenesei River. By Maud D. Haviland.

Avicultural Magazine. VII, No. 2. December, 1915.

Some Firefinches and other Gambian Birds. By E. Hopkinson (continued in No. 4.)

Avicultural Magazine. VII, No. 3. January, 1916.

The Genus *Zosterops*. By A. G. Butler.

Spring in New South Wales. By G. A. Heumann.

Cassowaries. By Dr. Graham Renshaw.—Notes on breeding and rearing in the London Zoo.

Humming Birds in their Native Haunts [Argentine and Chili]. By F. E. Blaauw.

The American Bittern in Captivity. By I. Dorrien-Smith.

Avicultural Magazine. VII, No. 4. February, 1916.

The European Goldfinch. By Dr. A. G. Butler.—With illustrations from photographs.

Sunbirds in their Native Haunts [S. Africa]. By T. E. Blaauw.

The Emu. XV, Part 3. January, 1916.

Pacilodryas albigularis. By A. J. Campbell.—With colored plate.

A Trip to the Northern end of the Flinders Ranges. By S. A. White.

Nesting Habits of the Mistletoe Bird (*Dicaeum hirundinaceum*). By S. A. Lawrence and R. T. Littlejohns.

Notes upon the Yellow-mantled Parrot (*Platycercus splendidus* Gould). By H. L. White.

Remarks on the Proposed Second Edition of the "Official Check-List of the Birds of Australia." By G. M. Matthews.

Birds of a Murray Island. By C. Barrett.

Bird Life at Dumbleyung. By M. W. Elliott.

Procellariiformes in Western Australia. By W. B. Alexander.

Notes on the Ground Cuckoo-Shrike (*Pteropodocys phasianella*). By C. F. Cole.

Morning Song of the Noisy Miner (*Myzantha garrula*). By R. Hall.

South Australian Ornithologist. II, Part 5. January, 1916.

Birds of the North and Northwest of Australia. By G. M. Matthews.
A New Parrot for South Australia. By S. A. White.— *Barnardius barnardi lindoi* (p. 115), Moolooloo, Flinders Range.

The Migration of Swallows in South Australia. By A. M. Morgan.

Aquatic Birds breeding near Adelaide. By A. M. Morgan.

A Sketch of the Life of Samuel White (cont'd). By S. A. White.

The Austral Avian Record. III, No. 2. November 19, 1915.

On *Certhia atricapilla* Latham. By G. M. Matthews.

On the "Table des Planches Enlum." of Boddart. By G. M. Matthews and T. Iredale.— A list of new names proposed in this work and omitted in Sherborn's 'Index Animalium.' Among these is *Fringilla canadensis* for our Tree Sparrow, which will take us back again to the nomenclature of Audubon and his "Canada Bunting."

Additions and Corrections to my Reference List. By G. M. Matthews.

Austrotis australis melvillensis (p. 51), subsp. nov. from Melville Isl., N. Australia.

Pluvialis dominicus fulvus description of the chick and immature bird.

Revue Francaise d'Ornithologie. VII, No. 79. November 7, 1915.

A Contribution toward an Ornithological Study of Provence. By J. L'Hermite (continued in Nos. 81 and 82).

Observations on the Birds of Newport, Belgium, during the War 1914-1915. By J. de Tristan.

The Snipe. By M. de la Fuye (continued in No. 80).

Birds and Electricity. By P. Bede.— Discussion of the killing of birds by telegraph wires.

Revue Francaise d'Ornithologie. VII, No. 80. December 7, 1915.

List of Birds Observed at Lemnos in April, 1915. By Dr. M. Millet-Horsin.

Note on *Accipiter major* (Degl. & Gerbe). By F. Daguin.

Biological Observations on Birds of Kerguelen Island. By J. Loranchet (continued in No. 81).

Revue Francaise d'Ornithologie. VIII, No. 81. January 7, 1916.

Notes on a Collection of Birds from New Caledonia and Lifou. By L. Brasil.— The following are described as new: *Chalcophaps chrysochlora disjuncta* (p. 195); *Haliastur sphenurus johannæ* (p. 201); *Pandion haliaetus microhaliaetus* (p. 201); *Sauropatis sancta canacorum* (p. 203) from New Caledonia; and *Tyto alba lifuensis* (p. 202), from Lifou.

Hunting and the Protection of Birds in French East Africa. By A. Menegaux.

Revue Francaise d'Ornithologie. VIII, No. 82. February 7, 1916.

Notes on a Collection of Birds from New Caledonia and Lifou (continued). By L. Brasil.

Note on the Ornithology of Marocca. By A. Vaucher.

Messenger Ornithologique. VI, No. 4.

A Journey to the Southeastern and Southern Parts of the Russian Altai and to Northwestern Mongolia. Main Ornithological Results. By P. Sushkin.

On the Ornithology of the Commander Islands. By B. M. Shitkov and S. G. Schtecher.

Sitta europæa taiwana nom. emend. By S. A. Buturlin (p. 311).— New name for *S. formosana* (nec *S. formosa* Blyth).

Carduelis carduelis colchicus subsp. nov. By Alex. Koudashev (p. 313).

Muscicapa atricapilla sibirica subsp. nov. By V. A. Chachlov.

Birds collected by A. P. Velezhanin in the Basin of the Upper Irtysh. By G. I. Poljakow (continued).

Ornithologische Monatschrift. XXXIX, No. 9. September, 1914.

New Facts on the Method of Propagation in Cuckoos. By K. Wenzel.

Ornithologische Monatschrift. XL, No. 1. January, 1915.

Contains reports on the several German bird reservations.

Ornithological Articles in Other Journals.¹

Piers, Harry. The Occurrence of European Birds in Nova Scotia. (Proc. and Trans. Nova Scotia Inst. Sci., XIII, Pt. 3, 1912-13, printed April 3, 1915.)

Williams, M. Y. Notes on the Herring Gull. (Ottawa Naturalist, November, 1915.)

Rintoul, L. J., and Baxter, E. V. Some Notes on Birds Moulting in their Winter Quarters. (Scottish Naturalist, January, 1916.)

Ticehurst, C. B. Notes on Migrants and Moults, with Special Reference to the Moults of Some of our Summer Visitors. (Scottish Naturalist, February, 1916.)

Butterfield, E. P. Observations on the Behavior of a Nestling Cuckoo. (Zoologist, January, 1916.)

B[ragg], L. M. Royal Terns on Devoe's Bank [S. C.]. (Bull. Charleston Mus., December, 1915.)

Lucas, F. A. The Beginnings of Flight. (Amer. Mus. Journal, January, 1916.)

Thomas, Rose H. White-collar Mendelising in Hybrid Pheasants. (Proc. Zool. Soc. London, 1915, pp. 279-284.)

Mitchell, P. Chalmers. Anatomical Notes on the Gruiform Birds. (Proc. Zool. Soc. London, 1915, pp. 413-423.)

Miller, L. H. The Owl Remains from Rancho la Brea. (Univ. of Cal. Publ., Geol. IX, No. 8, pp. 97-104.)

Hankinson, T. L. The Vertebrate Life of certain Prairie and Forest Regions near Charleston, Illinois. (Bull. Ill. State Lab. Nat. Hist., XI, pp. 281-303.)

¹ Some of these journals are received in exchange, others are examined in the library of the Academy of Natural Sciences of Philadelphia. The Editor is under obligations to Mr. J. A. G. Rehn for a list of ornithological articles contained in the accessions to the library from week to week.

Dennis, D. W. Why do our Birds Migrate. (Proc. Indiana Acad. Sci., 1914, pp. 145-148.) The author considers that birds building protected nests or which are able to protect them do not migrate, and that the others migrate in search of safety in nesting! Some of his listed migrants are however resident over a large part of their range.

Culbertson, Glenn. A Note on a Peculiar Nesting Site of the Chimney Swift. (Proc. Indiana Acad. Sci., 1914, p. 279.) — In an old dry well.

Beebe, C. William. A Tetrapteryx Stage in the Ancestry of Birds. (Zoologica II, No. 2, pp. 39-52.) — Finds well developed quills on leg of young dove just behind the femur, considered to be remains of 'posterior wing.'

Lashley, K. S. The Color-Vision of Birds. I. The Spectrum of the Domestic Fowl. (Jour. Anim. Behavior, VI, No. 1, pp. 1-26.) Finds that the fowl is sensitive to difference of wave length in light, irrespective of intensity.

Levick, G. M. Natural History of the Adelie Penguin. (Brit. Antarctic Exped., 1910, Zool. 1, No. 2, pp. 55-84.) — The same material, in a general way, as is embodied in his recent book upon the penguins.

Moulton, J. C. An Account of the Various Expeditions to Mt. Kinalu, British North Borneo. (Sarawak Mus. Jour. II, pt. II, No. 6, pp. 137-176.) — Contains list of ornithological papers.

Lewis, Frederick. List of Birds Observed in the Vedda Country during July, 1914. (Spolia Zeylanica X, pp. 158-165.) — 129 species of Ceylon birds.

Coward, T. A. A Note on the Behavior of a Blackbird.— A Problem in Mental Development. (Mem. and Proc. Manchester Lit. and Philos. Soc., 1914, pp. 1-8.) — The bird returned again and again to combat its own image in a window. It seemed to remember the spot where its antagonist was to be found but did not profit by the experience of continual failure to reach it.

Alvarado, Rodolfo. Los Colibries Mexicanos. (Bolet. Dirrec. Estad. Biolog. Mex. I, No. 2, pp. 45-95.) — A compiled résumé with descriptions from specimens.

Publications Received.— **Chapin, James P.** Four New Birds from the Belgian Congo. (Bull. Amer. Mus. Nat. Hist., XXXV, Art. III, pp. 23-29, February 21, 1916.)

Chapman, Frank M. Diagnoses of Apparently New Colombian Birds. IV. (Bull. Amer. Mus. Nat. Hist., XXXIV, Art. XXIII, pp. 635-662, December 30, 1915.)

Coale, Henry K. Birds of Lake County [Illinois.] [History of Lake County, 1912.] (Chapter XIV, pp. 353-370.)

Didier, Dr. Robert. La Macareux du Kamtschatka. Supplement au No. 82 de la 'Revue Française d'Ornith.,' 1916, pp. 1-16.

Grinnell, Joseph. Method of Caring for Study Skins of Birds. (Proc. Amer. Asso. Museums, Vol. IX, 1915, pp. 106-111.)

Henshaw, H. W. Report of Chief of Bureau of Biological Survey. (Ann. Repts. U. S. Dept. of Agr., 1915, pp. 1-15.)

Kellogg, Louise. Report upon Mammals and Birds found in Portions of Trinity, Siskiyou and Shasta Counties, California. An Analysis of the Vertebrate Fauna of the Trinity Region of Northern California. By Joseph Grinnell. (Univ. of Cal. Publ. in Zool., Vol. 12, Nos. 13 and 14, pp. 335-410, January 27, 1916.)

Lincoln, F. C. The Birds of Yuma County, Colorado. (Proc. Colo. Mus. Nat. Hist. [No Vol. or No.!] pp. 1-14, December 6, 1915.)

McGregor, R. C. (1) Birds in their Economic Relation to Man. (Bull. of Bureau of Science, Govt. of Philipp., No. 32, revised, pp. 1-14, December 29, 1915.) (2) Description of a New Species of *Prionochilus* from the Highlands of Luzon. (Philipp. Jour. of Sci., IX, No. 6, Sect. D., p. 531, pl. I, November, 1914.)

Murphy, R. C. Notes on American Subantarctic Cormorants. (Bull. Amer. Mus. Nat. Hist., XXXV, Art. IV, pp. 31-48, February 21, 1916.)

Oberholser, H. C. A Synopsis of the Races of the Crested Tern, *Thalasseus bergii* (Lichtenstein). (Proc. U. S. Nat. Mus., 49, pp. 515-526, December 23, 1915.)

Riley, J. H. Description of a New Hazel Grouse from Manchuria. (Proc. Biol. Soc. Wash., XXIX, pp. 17-18, January 25, 1916.)

Roberts, Thomas S. The Winter Bird-Life of Minnesota. Being an Annotated List of Birds that have been found within the State of Minnesota during the winter Months. (Geol. and Nat. Hist. Survey of Minn., Zool. Div., Occasional Papers, No. 1, pp. 1-20, February, 1916.)

Shufeldt, R. W. (1) The Gardens of the Zoölogical Society of Philadelphia. (Sci. Amer. Suppl., January 1, 1916, pp. 8-9.) (2) Nature-Study and the Common Forms of Animal Life. (Nature-Study Review, 12, No. 2, February, 1916, pp. 57-63.) (3) The Photographic Portraiture of Pets. (Popular Photography, February, 1916, pp. 217-223.) (4) Owls, as Regarded by the Scientist, Agriculturist, and the Sportsman. (Wilson Bull., No. 92, September, 1915, pp. 393-403.) (5) On a Restoration of the Base of the Cranium of *Hesperornis regalis*. (Bull. of Amer. Paleontology, No. 25, pp. 75-82, December 15, 1915.) (6) Incidents in Animal Intelligence. (Our Dumb Animals, January, 1916, pp. 123-124.) (7) Shall we Save the Quail from Extirpation? (*do.* March, 1916, pp. 147-148.)

Stanwood, Cordelia J. (1) The Red-breasted Nuthatch. (Home Progress. January, 1916, pp. 213-215.) (2) The Chronicle of a Tame Olive-backed Thrush. (Wilson Bull., No. 93, December, 1915, unpagged.) (3) A Skillful Architect. (The House Beautiful, February, 1916, pp. xli-xlii.)

Strong, J. F. A. Report of the Governor of Alaska on the Alaska Game Law, 1915. Washington, D. C., 1916, pp. 1-18.

Taylor, W. P. The Museum of Natural History and the Conservation of Game. (Proc. Amer. Assoc. of Museums, Vol. IX, 1915, pp. 96-103.)

Van Oort, E. D. (1) Een voor de Nederlandsche fauna nieuwe storm-

vogelsoort *Puffinus gravis* O'Reilly. (Ardea, 1915, p. 130.) (2) Resultaten van het ringonderzoek van het Rijks Museum te Leiden. (do. pp. 119-126.) (3) On a New Bird of Paradise from Central New Guinea, *Falcinellus meyeri albicans*. (Zoolog. Mededeelingen, Diel I, Afl. 3 en 4, p. 228.)

Washburn, F. L. Further Observations on Minnesota Birds: Their Economic Relations to the Agriculturist. (Circular 35, Office of State Entomologist, January 15, 1916, pp. 1-24.)

Wetmore, Alex. An Anatomical Note on the Genus *Chordeiles* Swainson. (Proc. Biol. Soc. Wash., XXVIII, pp. 175-176, November 29, 1915.)

Witherby, H. F. The "British Birds" Marking Scheme. (Brit. Birds, IX, No. 9, February 1, 1916, pp. 222-229.)

Abstract Proc. Linnaean Soc. N. Y., Nos. 26-27, 1913-1915, November 23, 1915.

Abstract Proc. Zool. Soc. London, No. 150, November 23, 1915.

American Museum Journal, The, XV, No. 8, XVI, No. 1, December, 1915 and January, 1916.

Austral Avian Record, The, III, No. 2, November 19, 1915.

Avicultural Magazine, (3) VII, Nos. 2, 3 and 4, December, 1915 to February, 1916.

Bird-Lore, XVIII, No. 1, January-February, 1916.

Blue-Bird, VIII, Nos. 1 and 2, December, 1915 and January, 1916.

British Birds, IX, Nos. 8 and 9, January and February, 1916.

Bulletin British Ornith. Club, Nos. CCX, CCXI, and CCXII, December 3 and 29, 1915, and February 3, 1916.

Bulletin of the Charleston Museum, XI, No. 8, December, 1915, and XII, Nos. 1 and 2, January and February, 1916.

Condor, The, XVIII, No. 1, January-February, 1916.

Emu, The, XV, Part 3, January, 1916.

Fins, Feathers and Fur, Bull. Minn. Game and Fish Com., No. 4, December, 1915.

Forest and Stream, LXXXVI, Nos. 1 to 3, January to March, 1916.

Ibis, The (10) IV, No. 1, January, 1916; and Jubilee Supplement, No. 2, December, 1915, Report on the Birds collected by the British Ornithologists' Union Expedition and the Wollaston Expedition in Dutch New Guinea. By W. R. Ogilvie Grant, pp. i-xx + 1-329, pl. 1-8, maps, A-B.

Messenger Ornithologique, VI, No. 4.

New Jersey Audubon Bulletin, No. 12, March 1, 1916, and Fifth Annual Report N. J. Audubon Society, October 5, 1915.

Oölogist, The, XXXII, No. 12, December, 1915, XXXIII, Nos. 1 and 2, January and February, 1916.

Ornithologische Monatschrift, 39, Nos. 8 to 11, 40, No. 1, August to November, 1915, and January, 1916.

Ottawa Naturalist, The, XXIX, Nos. 8 to 10, November, 1915 to January, 1916.

- Philippine Journal of Science**, X, No. 4, July, 1915.
Proceedings and Transactions Nova Scotia Inst. of Sci., XIII, Parts 3 and 4, XIV, Part 1.
Proceedings Academy of Natural Science of Phila.
Records of the Australian Museum, X, No. 11, November 5, 1915.
Annual Report for 1915.
Revue Francaise d'Ornithologie, VII, Nos. 79, 80, 81, 82, November, 1915 to February, 1916.
Science, N. S., XLII, Nos. 1095-1096, XLIII, 1097-1107.
Scottish Naturalist, The, Nos. 48, 49 and 50, December, 1915 to February, 1916.
South Australian Ornithologist, The, II, Part 5, January, 1916.
Wilson Bulletin, The, XXVII, No. 4, December, 1915.
Zoologist, The, XIX, No. 228, December, 1915, XX, Nos. 229 and 230, January and February, 1916.
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CORRESPONDENCE.

Membership in the A. O. U.

EDITOR OF 'THE AUK,'

Dear Sir:—

As I fail to find in the corrected copy of the A. O. U. by-laws, sent me by Mr. Sage, any changes whereby the working ornithologists in the Associate Class are benefited, I have this day sent in my resignation as an 'Associate' in the A. O. U. This step also was necessary, by the refusal by 'The Auk,' of further articles dealing with "proposed changes," previous to the last A. O. U. meeting in San Francisco. In my open letter on the subject, I asked for a free discussion in 'The Auk.' This was denied me, as well as others who cared to take part in it. It is evident, that the Fellows, who like I, desired a changed by-laws, to meet changed conditions, were absent, or were over ruled at the last meeting. By leaving the A. O. U. I am not giving up any work so dear to me, and my friends will still find my collection of birds, mammals and eggs, as well as my home, open at all time to them.

Very truly yours,

HAROLD H. BAILEY.

Newport News, Va.

Sunday, the 19th of December, 1915.

[As Mr. Bailey's statement regarding his discussion in 'The Auk' may be misleading, the editor desires to state that the *only* communication

which was refused publication was one from Mr. Bailey discussing the fitness of certain gentlemen for the various classes of membership. As Mr. Bailey declined to omit this personal matter his letter was returned.]

Graphic Representation of Bird Song.

[At Mr. Moore's special request 'The Auk' publishes his letter, below. With his permission a copy was sent to Mr. Saunders whose rejoinder follows. These contributions will close this discussion.—Ed.]

EDITOR OF 'THE AUK,'

Dear Sir:—

In the January issue of 'The Auk' Mr. Saunders complains that "many of the faults" I found with his system "are the result of misunderstanding." If I misunderstood him, I regret it. My purpose was to point out kindly to one who is just beginning to record bird-songs scientifically, the limitations of his methods, so plain to those who have devoted years to the same study. I assumed that when he elected to employ technical terms, he would wish to use them with the "scientific" precision musicians employ. Now that he admits attaching to them the various and often contradictory meanings found in large family dictionaries, the reason for our misunderstanding is apparent. I am no longer astounded by his careless use of such technical terms as, "duration," "time" and "rhythm," and his most serious confusion of the "trill" with the "repeated note." When he has "recorded enough songs" even of the few species he has worked on, he will have to revise his wild assumption that the "shake must be rare in bird music." The shake or trill is not rare! Indeed, it is employed by the *very* birds whose songs he records! It is not uncommon in songs of Field Sparrow, Song Sparrow and Purple Finch, and in a form of wide range is *characteristic* of the Vesper Sparrow.¹ If Mr. Saunders really cares to be as "scientific" as musicians, he will find this factor decidedly "worth bothering" his "head about!"

Mr. Saunders casts many aspersions at the methods of musicians. Among others, he charges them with artificially *changing* bird songs "in both pitch and time to fit the method." It is possible he did this when he used the musical method, but I know of none who have. Our field methods are just as scientifically accurate as his, for some of us discovered the stopwatch long ago and use both it and the more valuable metronome. Personally I do not "decide on some key the bird is supposed to sing!" I do *not* record the key in the field *at all* and if none exists, leave the song as it is. As to pitch, I record every note that is off the pitch with its approximate variation, which is all that Mr. Saunders does. As to time I use for a unit

¹ See Schuyler Matthews' "Field Book of Wild Birds and Their Music, pp. 106-122-123-87.

the $1/64$ note, which is often a smaller unit than Mr. Saunder's $1/10$. It is just exactly as accurate to measure a song by $1/64$ notes as by $1/10$ s, even if the song is *not* rhythmical. If it is rhythmical (which is true of 95 songs out of 100) the use of the musical unit permits a clear indication of the rhythm, which is vitally important! Mr. Saunder's records do *not* indicate the rhythm clearly, for in six of his songs, whose authors invariably sing rhythmically, the rhythm is absolutely obscured by his failure to mark the *accented notes*. In his Robin's record it is possible to show it *existed*, only because the pauses *happen* to be all of the same length and come at regular intervals.

I agree with Mr. Saunders it is "absolutely ludicrous" to play bird-songs on the piano and expect them to sound like the bird. I regret that the old system is so "intricate" and "unintelligible" to him, but hundreds of thousands of people do understand it and thousands of *children* from six to fourteen years of age readily grasp it. The vital difference between the two systems is this: The new method is most efficient for exploitation of such obvious things as the "duration of the songs"; the old system is most efficient for recording the really important factors,— the harmonical relations of the song and its rhythmical beat, which latter for most songs is the "specific character."

ROBERT THOMAS MOORE.

Haddonfield, N. J.

EDITOR OF 'THE AUK,'

Dear Sir:—

Replying to Mr. Moore's latest remarks concerning methods of recording bird songs, it might not be irrelevant to the subject to say that musicians are as a rule artists and not scientists. The science necessary for the student of bird songs consists almost entirely of the physics of sound, not the use of technical musical terms. The student of bird songs is working primarily for the ornithologist, not the musician. So why use an obscure, musical definition of a trill or cast slurs at the "large family dictionary" when the small pocket dictionary is, as far as my examination of it goes, equally to blame?

It would throw much light on the subject, and remove some serious objections to the old method, if Mr. Moore would explain how he is able to record certain bird songs on the musical scale without artificially changing them to fit the method. How, for instance would he write a note pitched half way between A and A flat? How can he record in $1/64$ notes and multiples of it, notes whose relative durations are incommensurable?

The old system is not unintelligible to me. I began its study myself when somewhere between six and fourteen years of age, and have considerable use for it at the present time. But I still believe that it is too intricate and mechanical to be of the highest utility in recording bird songs. That my original records did not show accent, which is simply a variation in

intensity of notes, does not weaken the graphic system in any way, for I have mentioned more than once how variations in intensity may be represented by this method, and have recorded this factor in the field in many of my more recent records.

"The proof of the pudding is in the eating." If either method proves to be unworthy in the light of the other, it will sooner or later be discarded, regardless of either Mr. Moore's or my opinions on the subject at the present time. I only ask that the future student of bird songs give both methods a fair and unprejudiced trial in the field, and then use that method which he truly finds to be most accurate, comprehensive, scientific and simple.

ARETAS A. SAUNDERS.

New Haven, Conn.

Mar. 9, 1916.

NOTES AND NEWS.

THE American Ornithologists' Union has sustained one of the greatest losses in its history in the death of Daniel Giraud Elliot on December 22, 1915. Dr. Elliot was one of the founders of the Union and its second president while his deep interest in the society and its welfare was maintained until the time of his death. His name and his scientific publications are familiar wherever ornithology and mammalogy are studied, but those who were privileged to know him personally will appreciate far more the loss that we have sustained. Possessed of a striking personality, dignity and kindness of manner Dr. Elliot left a lasting impression upon all with whom he came in contact, and inspired with love and respect those with whom he was familiarly associated.

In accordance with custom the president of the Union has appointed one of the Fellows to prepare a biographical notice to be read at the Meeting in November and published in the January number of 'The Auk.' Dr. Frank M. Chapman has been his choice and has accepted the appointment. It will therefore be only necessary in this connection to mention briefly some of the principal events in Dr. Elliot's life.

Daniel Giraud Elliot was born in New York City, March 7, 1835. In early life he travelled for some years in southern Europe, the West Indies and Brazil. Returning to New York he pursued the study of ornithology which seems to have always been his chief interest. Much of his time was spent at the Academy of Natural Sciences at Philadelphia, which was then,

through the influence of John Cassin, Dr. T. B. Wilson and others the center of ornithological activity in America.

In 1864 he began the publication of his 'Monograph of the Tetraonidæ,' the first of a series of sumptuous folio works with hand colored plates. There followed monographs of the Pittidæ and Phasianidæ and a volume on new or unfigured North American Birds.

In 1869 Dr. Elliot went to England and remained abroad almost continuously until 1883. In these years he became closely associated with the British ornithologists and this period of his life is pictured in his biography of Dr. Sclater (*Auk*, 1914, pp. 1-12). His publications during this period comprise monographs of the Paradisidæ, Bucerotidæ, and the Felidæ, the last marking the beginning of his study of the mammals. Numerous other papers were published in 'The Ibis' and the 'Proceedings' of the Zoological Society of London, etc., and on his return to America, he contributed a number of chapters to the 'Standard Natural History.'

Dr. Elliot was the scientific advisor of the trustees during the early days of the American Museum of Natural History and was instrumental in securing for them many of the first collections obtained by this institution, while his own collections and library passed into its possession through gift and purchase.

In 1894, Dr. Elliot accepted the curatorship of zoölogy in the Field Museum, at Chicago, and at once began the accumulation of a vast collection of mammals while a series of comprehensive volumes from his pen on the mammals of North and Middle America were published in rapid succession. While at the Field Museum Dr. Elliot made a notable expedition to Somaliland, Africa, and later to the Olympic Mountains of Washington, securing valuable collections.

Returning to New York in 1906 he established himself at the American Museum and began his 'Review of the Primates' an undertaking upon which he was engaged for six years and which necessitated his visiting all of the principal museums of America, Europe and Asia.

Dr. Elliot was an artist of ability and the plates of his earlier monographs were from his own paintings. In addition to his numerous scientific publications he prepared, in 1895-1898, three volumes of a more popular type on the game birds of North America which were well received by sportsmen and others interested in these groups.

Dr. Elliot was a member of a number of scientific Societies, both at home and abroad. In 1906 Columbia University conferred upon him the degree of Sc. D. and 1915 he was made a trustee of the American Museum in which institution much of his interest had been centered. During his long life he was the recipient of many other honors in recognition of his splendid publications and his distinguished contributions to the advancement of systematic zoölogy.

HENRY EELES DRESSER¹ an Honorary Fellow of the American Ornithologists' Union, died at Cannes, France, on November 28, 1915, where he had gone in the hope of recovering his health. Mr. Dresser's name has been closely associated with bird study in England for over half a century and he was one of the last of a generation of systematic ornithologists to whom the science is largely indebted for its present advanced position.

Mr. Dresser was for years a member of the Linnean Society and the Zoological Society of London and joined the British Ornithologists' Union in 1865, serving as secretary from 1882 to 1888. His most notable work was the monumental 'Birds of Europe' in nine quarto volumes with colored plates, with which his name will ever be associated. This appeared from 1871 to 1881 with a supplementary volume in 1895-6. He later published an octavo 'Manual of Palearctic Birds,' which was an invaluable reference volume to many who were unable to obtain the larger and far more expensive work. Mr. Dresser was also the author of an illustrated work on the eggs of European birds and monographs of the Rollers and Bee-eaters, besides many shorter articles.

He accumulated a large collection of birds and eggs and an extensive library, all of which have come into the possession of the Manchester Museum.

In spite of the extent of Mr. Dresser's ornithological activities and the magnitude of his achievements, his time was not devoted exclusively to his favorite study. For many years ornithological investigations were incidental to a busy business career, though for many years before its publication was begun he had definitely planned his 'Birds of Europe' so that his observations were made with that object in view.

He was born in London, May 9, 1838, and was educated in England, Germany and Sweden. In 1856 he entered the office of a lumber firm in Finland, this being his father's business, and for eight years was engaged in lumber industry in various parts of Europe and in New Brunswick. In 1863 he took a cargo to Texas consigned to the Confederate government and during some months' residence near San Antonio was intimately associated in ornithological investigation with Dr. A. L. Heermann then residing there. From 1864 to 1871 he was engaged in the iron trade in London travelling extensively meanwhile in many parts of northern Europe, Turkey and the Balkan States. His wide experiences and his familiarity with a number of languages gave him a fund of knowledge which was always placed cheerfully at the service of his friends and correspondents and several of his translations have made available to English speaking ornithologists important papers in Russian, Swedish, etc.

Mr. Dresser was noted for his cheerfulness and sweetness of temper, qualities which even those who knew him as did the writer, only as a correspondent, can readily appreciate.—W. S.

¹ For most of the facts contained in this notice, acknowledgment is made to an obituary by Mr. J. E. Harting in 'The Field' for Dec. 11, 1915.

WILLIAM CHARLESWORTH LEVEY, son of William Marshall and Anne Maud Charlesworth Levey, an Associate of the American Ornithologists' Union, was born in Indianapolis, Indiana, November 13, 1887, and died July 5, 1914, at his summer home on the east shore of Alton Bay, Lake Winnepesaukee, New Hampshire. He was deeply interested in bird protection and conservation, and was a skilled photographer, some of his pictures appearing in Forbush's 'Game Birds, Wild Fowl and Shore Birds.' His annotated lists of the birds of South Carolina, and of Alton Bay, New Hampshire, were published in Maynard's 'Records of Walks and Talks with Nature.' — J. H. S.

LESLIE WALDO LAKE, an Associate of the American Ornithologists' Union, died February 7, 1916. He was born April 25, 1849, in Hamburg township, Erie Co., N. Y. He was principal of several schools, and from 1888 to 1891 was district School Commissioner. In the latter year he engaged in business in Hamburg, where he always took a prominent part in public affairs. Mr. Lake was one of the oldest and best known amateur ornithologists in this section and was also much interested in botany and archæology. — T. L. B.

SINCE systematic ornithology is not much over a century and a half old we have only recently begun to consider what was going on one hundred years ago. This sort of retrospect is well worth while as it brings more clearly to our attention the relative position of various important works which we are accustomed to quote independently, without much regard to their relationship to other publications. A series of notes gathered by Dr. Charles W. Richmond in his researches amongst the ornithological literature of the past, and kindly placed at the disposal of 'The Auk,' throw some interesting light on the progress of ornithology in 1816 — a really notable year in the history of our science.

The work which stands out as the great work of the year is of course Vieillot's 'Analyse,' an unpretentious brochure of 128 pages in which a classification of birds is set forth including some 138 new genera. It is announced as among the new books for the week of April 20, 1816 (Bibl. de la France of that date) though curiously enough Vieillot maintained that it was published in December (Ferussac's Bull. xv, Sept. 1828, p. 143).

Several authors tried to discredit Vieillot's important work by claiming that he had had access to the Paris Museum's galleries and had adopted various manuscript names which Cuvier had placed on the specimens and which were about to be published in his 'Règne Animal,' which appeared in December, 1916. (cf. Mathews Nov. Zool. XVIII, p. 18). A 'critique' on the 'Analyse' was published by Temminck in Amsterdam in 1817. As a matter of fact Vieillot had the 'Analyse' in mind and at least partly prepared long before 1816 (cf. his Ois. Chant. p. 74). In 1813 he submitted the manuscript to the Turin Academy and in 1814 to the Linnean Society of London neither of which accepted it. (Analyse, p. 20,

note). In London Stephens had access to it and adopted several of Vieillot's names publishing them in his continuation of Shaw's 'General Zoology' (Vol. IX, pts. 1 & 2) which probably appeared in the first half of 1816, as it is noticed in the 'British Review' for August, 1816, as one of the new books from the period April 10 to July 10, of that year. This presents a nice question of priority but it would appear as if Vieillot deserved the benefit of the doubt!

Vieillot's ability as a systematic ornithologist seems not to have been appreciated by his contemporaries and he was apparently treated very unfairly. Correspondence between ornithologists of his time would no doubt reveal some very interesting side lights upon this matter!

Vieillot's *Analyse* was the expression of a more or less widespread desire for more generic groups than were provided in the systems of Linnæus and Brisson. Additional genera had of course been proposed since their time but they were scattered here and there and most of them were for new species rather than for segregates of the old genera.

Bonnaterre in his volume of the 'Encyclopedie Méthodique' (1790); Lacépède in his 'Tableau' (1799) and Daudin in his 'Traité Élémentaire' (1800) made attempts in this direction, but the first and last of these works were never completed while the second was never followed by a fuller treatment such as the author evidently intended; so that the field lay open for Vieillot and he took advantage of it, though the conservatives evidently did what they could to discourage him, and not until years after his death was his work appreciated at its full value. Curiously enough the eccentric Rafinesque came near depriving him of his glory as he likewise produced an 'Analyse' in 1815 in which a number of substitute names are suggested for existing genera and 138 new names are proposed! These latter however, are unaccompanied by diagnoses or specific examples so that they fall as *nomina nuda* and it is impossible to tell for what birds they were intended.

Another publication of 1816 is a curious 'Systematic Catalogue of Indigenous Mammals and Birds in the British Museum' by W. E. Leach printed on one side of the leaves in the form of labels. The several new names that occur here have been pretty generally rejected today as *nomina nuda* but the book is in any case an interesting curiosity and a great rarity. Both it and Vieillot's 'Analyse' were reprinted by the Willoughby Society. The introduction to the Leach reprint, by the way, fails to mention among the known copies of the original one in the library of the Philadelphia Academy.

On January 22, Mr. C. William Beebe of the New York Zoölogical Society sailed for Demarara to establish a tropical zoölogical station for the study of the evolution of birds and the life histories of important South American species. Incidentally large numbers of living vertebrates will be secured and shipped to New York for exhibition in the Zoölogical Park. Mr. Beebe is accompanied by Messrs. G. Inness Hartley, Paul G. Howes and Donald Carter.

At the Annual Meeting of the Delaware Valley Ornithological Club held at the Academy of Natural Sciences of Philadelphia, January 6, 1916, Henry W. Fowler was elected president for the ensuing year; George H. Stuart 3rd, Vice President; J. Fletcher Street, Secretary and Dr. Samuel C. Palmer, Treasurer. Communications were made during the past year by Dr. Wm. E. Hughes, on 'Bird-life in Italy'; Samuel N. Rhoads, 'A Trip to Guatemala'; David E. Harrower, 'Birds Observed in Costa Rica'; Dr. Witmer Stone, 'Our Western Birds and their Haunts' and J. Fletcher Street, 'Rare Birds of the Pocono Mt.'

MR. W. LEON DAWSON of Santa Barbara, Cal., has made over his valuable collection of birds' eggs and nests to a board of trustees who are incorporating an institution to be known as the Museum of Comparative Oölogy, in which it is hoped to accumulate a representative collection of the nests and eggs of the birds of the world. Mr. Dawson is to have responsible control of the collection during his life in order to insure its proper care during the early years of the enterprise. At the expiration of three years during which he will be engaged in field work in connection with the forthcoming 'Birds of California,' a campaign will be inaugurated for an endowment and a group of buildings suitable for housing the collection. A number of prominent oölogists and ornithologists have been invited to form a Board of Visitors to coöperate with the museum management.

'BLUE-BIRD,' formerly edited by Dr. Eugene Swope, has now passed into the hands of Elizabeth C. T. Miller of Cleveland, Ohio, who as owner and editor is conducting it as a monthly. Volume VIII began with the December number and presents a very creditable appearance.

THE next stated meeting of the American Ornithologists' Union will be held at the Academy of Natural Sciences, at Philadelphia, November 14-16, with a business session on the 13th. It has been the general consensus of opinion that a return to the former time of meeting, the second Tuesday of November is desirable as it is convenient to the largest number of members. In accordance with the recent amendments to the By-Laws, proposed for the purpose of broadening the organization of the Union, the class of Members will this year, for the first time, take part in the business sessions and participate in the election of Members, Associates and Officers. This innovation will doubtless bring together a much larger number of Members and Fellows than usual. Furthermore owing to the fact that last year's meeting was held in San Francisco, where most of the eastern members were unable to attend, there will be an unusually full attendance of all classes from the east at the Philadelphia meeting, while not a few from 'the coast' stimulated by last year's meeting have signified their intention of being present. All in all this meeting promises to be one of the largest that the Union has held and it is none too soon for members to

make their plans for attending. We earnestly urge those who have not before attended to do so this year as the social intercourse made possible by these gatherings is of inestimable benefit both to the individual and the society, in promoting ornithological interest.

OFFICERS AND COMMITTEES OF THE AMERICAN ORNITHOLOGISTS' UNION. 1916.

	Expiration of Term.
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STONE, WITMER..... }	
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DWIGHT, JONATHAN, <i>Treasurer</i>	" 1916.

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DEANE, RUTHVEN.....	November, 1916.
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GRINNELL, JOSEPH.....	" 1916.
LUCAS, FREDERIC A.....	" 1916.
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RICHMOND, CHARLES W.....	" 1916.
ROBERTS, THOMAS S.....	" 1916.
ALLEN, J. A.....	} Ex-Presidents.
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CHAPMAN, FRANK M.....	
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MERRIAM, C. HART.....	
NELSON, EDWARD W.....	
RIDGWAY, ROBERT.....	

EDITORIAL STAFF OF 'THE AUK.'

STONE, WITMER, <i>Editor</i>	November, 1916.
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Committee on Publications.

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SAGE, JOHN H., <i>Secretary</i> .	DWIGHT, JONATHAN.

Committee of Arrangements for the Meeting of 1916.

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FELLOWS, MEMBERS, AND ASSOCIATES OF THE
AMERICAN ORNITHOLOGISTS' UNION.

APRIL, 1916.¹

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	Date of Election.
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ANTHONY, A. W., Ironside, Ore.....	(1885)1895 ²
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COOKE, Prof. WELLS W., 1450 Fairmount St., Washington, D. C.....	1884
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GRINNELL, JOSEPH, Mus. Vert. Zoöl., Univ. Cal., Berkeley, Cal.	(1894)1901
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JONES, LYND, Spear Laboratory, Oberlin, Ohio.....	(1888)1905

¹ Members of the Union, and subscribers to 'The Auk' are requested to promptly notify Dr. JONATHAN DWIGHT, Treasurer, 134 W. 71st St., New York City, of any change of address.

² Dates in parentheses indicate dates of joining the Union.

* Life Fellow.

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LUCAS, DR. FREDERIC A., Am. Mus. Nat. Hist., N. Y. City ...	(1888)1892
MAILLIARD, JOSEPH, 1815 Vallejo St., San Francisco, Cal.	(1895)1914
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STEJNEGER, DR. LEONHARD, U. S. Nat. Mus., Washington, D. C. (1883)1911	

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HELLMAYR, DR. CARL E., Neuhauserstrasse 51.II, Munich, Germany (1903)1911	

* Life Fellow.

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 PYCRAFT, WILLIAM PLANE, British Museum (Nat. Hist.) Cromwell
 Road, London, S. W. (1902)1911
 REICHENOW, Dr. ANTON, Königl. Mus. für Naturkunde, Invaliden-
 strasse, 43, Berlin. (1884)1891
 ROTHCHILD, Hon. LIONEL WALTER, Zoological Museum, Tring, Eng-
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 SALVADORI, Count TOMMASO, Royal Zool. Museum, Turin, Italy 1883
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- KNOWLTON, F. H., U. S. Nat. Mus., Washington, D. C. (1883)1902
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Brooklyn, N. Y. (1905)1914
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- NORTON, ARTHUR H., Museum Natural History, 22 Elm St., Port-
land, Maine. (1890)1902
- PEARSON, T. GILBERT, 2257 Loring Place, New York City. (1891)1902
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- RILEY, JOSEPH H., U. S. National Museum, Washington, D. C. (1897)1905
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(1885)1901
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- SWARTH, HARRY S., Mus. Vert. Zool., Univ. of Cal., Berkeley, Cal. (1900)1909
- TAVERNER, PERCY A., Victoria Memorial Museum, Ottawa, Canada
(1902)1909
- THAYER, JOHN ELIOT, Lancaster, Mass. (1898)1905
- TODD, W. E. CLYDE, Carnegie Museum, Pittsburgh, Pa. (1890)1901
- TOWNSEND, CHARLES H., Aquarium, Battery Park, New York City
(1883)1901
- TOWNSEND, Dr. CHARLES WENDELL, 76 Marlborough St., Boston,
Mass. (1901)1905
- TROTTER, Dr. SPENCER, Swarthmore College, Swarthmore, Pa. (1888)1901

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WETMORE, ALEX., Biological Survey, Washington, D. C.....	(1908)1912
WILLETT, GEORGE, 2123 Court St., Los Angeles, Cal.....	(1912)1914
WOLCOTT, DR. ROBERT H., Univ. of Nebraska, Lincoln, Neb..	(1901)1903
WOOD, NORMAN A., Museum Univ. of Mich., Ann Arbor, Mich..	(1904)1912
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ALLEN, MARY P., 206 Moon St., Hackettstown, N. J.....	1913
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ANDERSON, ERNEST M., Provincial Museum, Victoria, B. C.....	1915
ANDERSON, MRS. J. C., Great Barrington, Mass.....	1903
ANGELL, WALTER A., 33 Westminster St., Providence, R. I.....	1901
ANTHONY, H. E., Amer. Mus. Nat. Hist., New York City.....	1911
ANTHONY, MRS. S. REED, 175 Beacon St., Boston, Mass.....	1913
ARMSTRONG, EDWARD E., 207 N. Michigan Ave., Chicago, Ill.....	1904
ARNOLD, EDWARD, Grand Trunk R'y., Montreal, Quebec.....	1894
ARNOLD, DR. W. W., 504 N. Nevada Ave., Colorado Springs, Colo...	1910
AVIS, EDWARD, Box 56, Enfield, Conn.....	1908
AYRES, MISS MARY ADELINE, 119 High St., Medford, Mass.....	1915
BABCOCK, DEAN, Estes Park, Colo.....	1911
BAILEY, DR. B. H., 405 S. 22 St., Cedar Rapids, Ia.....	1913
BAILEY, PROF. GUY A., Geneseo, N. Y.....	1910
BAILEY, SAMUEL WALDO, Box 212, Newburyport, Mass.....	1909
BAKER, FRANK COLLINS, 1555 Highland Ave., Rochester, N. Y.....	1907
BAKER, JOHN H., Nat. Cash Register Co., Dayton, Ohio.....	1911
BALDWIN, ROGER N., 3739 Windsor Place, St. Louis, Mo.....	1904
BALES, DR. BLENN R., 149 W. Main St., Circleville, Ohio.....	1907
BALL, MRS. BENNET F., Oakville, Conn.....	1905
BALL, DAVID S., 622 W. 113 St., New York City.....	1913
BALL, MISS HELEN AUGUSTA, 43 Laurel St., Worcester, Mass.....	1893
BALL, DR. JAS. P., 5001 Frankford Ave., Philadelphia, Pa.....	1911
BANKS, MISS MARTHA B., Westport, Conn.....	1911
BARBOUR, REV. ROBERT, Y. M. C. A., Montclair, N. J.....	1902
BARKER, MERLE TAFT, 178 High St., Taunton, Mass.....	1915

BARNARD, Judge JOB, 1306 Rhode Island Ave., Washington, D. C.	1886
BARNES, Hon. R. MAGOON, Lacon, Ill.	1889
BARRETT, CHAS. H. M., 1339 Valley Place, S. E., Washington, D. C.	1912
BARRETT, HAROLD LAWRENCE, 704 Centre St., Jamaica Plain, Mass.	1909
BARRY, Miss ANNA K., 5 Bowdoin Ave., Dorchester, Mass.	1907
BARTLETT, Miss MARY F., 227 Commonwealth Ave., Boston, Mass.	1912
BARTLETT, WM. M., Silver Hill Road, South Lincoln, Mass.	1913
BARTRAM, EDWIN B., Strafford, Pa.	1913
BATTEN, GEORGE, 93 Union St., Montclair, N. J.	1911
BATTEN, GEORGE, JR., 381 Fourth Ave., New York City	1914
BAYNES, ERNEST H., Meriden, N. H.	1912
BECK, ROLLO HOWARD, San José, R. D. 21, Cal.	1894
BELL, Prof. W. B., Agricultural College, N. D.	1912
BENNETT, Rev. GEO., Iowa City, Ia.	1913
BENNETT, WILLIAM J., 1941 1st St. N. W., Washington, D. C.	1901
BENSON, C. STANLEY, 75 Plymouth St., North Abington, Mass.	1915
BETTS, NORMAN DE WITT, Forest Products Lab., Madison, Wis.	1908
BICKNELL, Mrs. F. T., 319 S. Normandie Ave., Los Angeles, Cal.	1913
BIDDLE, Miss EMILY WILLIAMS, 2201 Sansom St., Philadelphia, Pa.	1898
BIGELOW, ALBERT F., 84 State St., Boston, Mass.	1910
BIGELOW, Dr. LYMAN F., 80 Winter St., Norwood, Mass.	1914
BLACKWELDER, ELIOT, Univ. of Wisconsin, Madison, Wis.	1895
BLAIN, MERRILL W., 1026 N. Coronado St., Los Angeles, Cal.	1910
BLAKE, SIDNEY F., 154 Walnut St., Stoughton, Mass.	1910
BLOOMFIELD, Mrs. C. C., 723 Main St., W., Jackson, Mich.	1901
BOARDMAN, Miss E. D., 416 Marlborough St., Boston, Mass.	1906
BOGARDUS, Miss CHARLOTTE, Elm St., Coxsackie, N. Y.	1909
BOGERT, WILLIAM S., 1000 Garden St., Bellingham, Wash.	1904
BOLLES, Mrs. FRANK, 6 Berkeley St., Cambridge, Mass.	1912
BOLT, BENJAMIN FRANKLIN, 1421 Prospect Ave., Kansas City, Mo.	1909
BOND, HARRY L., Lakefield, Minn.	1908
BORLAND, WM. G., 14 Wall St., New York City	1911
BORNEMAN, HENRY S., 1613 Dyre St., Frankford, Philadelphia, Pa.	1912
BOSSON, CAMPBELL, 722 Tremont Bldg., Boston, Mass.	1906
BOULTON, W. RUDYUD, JR., 338 1st St., Beaver, Pa.	1915
BOURNE, THOS. L., Hamburg, N. Y.	1914
BOWDISH, B. S., Demarest, N. J.	1891
BOWDISH, Mrs. B. S., Demarest, N. J.	1902
BOWDITCH, HAROLD, 60 Harvard Ave., Brookline, Mass.	1900
BOWDITCH, JAMES H., 903 Tremont Bldg., Boston, Mass.	1913
BRACKEN, Mrs. HENRY M., 1010 Fourth St., S. E., Minneapolis, Minn.	1897
BRADBURY, W. C., 1440 Race St., Denver, Colo.	1915
BRADLEE, THOMAS STEVENSON, Somerset Club, Boston, Mass.	1902
BRANDRETH, FRANKLIN, Ossining, N. Y.	1889
BRANDT, HERBERT W., 2025 East 88 St., Cleveland, Ohio	1915
BREWSTER, EDWARD EVERETT, 316 East C St., Iron Mountain, Mich.	1893

BREWSTER, MRS. WILLIAM, 145 Brattle St., Cambridge, Mass.	1912
BRIDGE, EDMUND, 52 Wyman St., West Medford, Mass.	1910
BRIDGE, MRS. EDMUND, 52 Wyman St., West Medford, Mass.	1902
BRIMLEY, H. H., Raleigh, N. C.	1904
BRISTOL, JOHN I. D., 1 Madison Ave., New York City	1907
BRITTEN, G. S., 302 University Bldg., Syracuse, N. Y.	1913
BROCK, DR. HENRY HERBERT, 687 Congress St, Portland, Me.	1894
BROCKWAY, ARTHUR W., Hadlyme, Conn.	1912
BROOKS, REV. EARLE AMOS, 419 N. River Ave., Weston, W. Va.	1892
BROOKS, MAURICE GRAHAM, French Creek, W. Va.	1915
BROWN, MISS ANNIE H., 31 Maple St., Stoneham, Mass.	1909
BROWN, EDWARD J., U. S. Nat. Museum, Washington, D. C.	1891
BROWN, HARRY A., 40 Talbot St., Lowell, Mass.	1912
BROWN, MRS. HENRY TEMPLE, Lancaster, Mass.	1912
BROWN, PHILIP G., 85 Vaughan St., Portland, Me.	1911
BROWN, STEWARDSON, 20 E. Penn St., Germantown, Philadelphia, Pa.	1895
BROWN, WM. JAMES, 250 Oliver Ave., Westmount, Quebec.	1908
BROWNING, WM. HALL, 16 Cooper Square, New York City	1911
BRUEN, FRANK, 69 Prospect St., Bristol, Conn.	1908
BRYANT, HAROLD CHILD, Mus. Vert. Zool., Univ. of California, Berkeley, Cal.	1913
BURBANK, CHAS. O., 48 Glenwood Ave., Newton Centre, Mass.	1912
BUCKWALTER, MRS. A. I., Union, Mass.	1915
BURGESS, JOHN KINGSBURY, Chestnut St., Dedham, Mass.	1898
BURLEIGH, THOS. D., 825 N. Negley Ave., Pittsburgh, Pa.	1913
BURNETT, WILLIAM L., State Agric. College, Fort Collins, Colo.	1895
BURNHAM, JOHN BIRD, 233 Broadway, New York City	1912
BURT, HENRY P., 355 Union St., New Bedford, Mass.	1908
BURTCH, VERDI, Branchport, N. Y.	1903
CABOT, LOUIS, Brookline, Mass.	1904
CADUC, EUGENE E., 512 Massachusetts Ave., Boston, Mass.	1910
CALLENDER, JAMES PHILLIPS, 32 Broadway, New York City	1903
CALVERT, J. FLETCHER, 596 Princess Ave., London, Ont.	1912
CAMPBELL, MISS CLARA D., 1253 Beacon St., Brookline, Mass.	1913
CARPENTER, REV. CHARLES KNAPP, 311 Park St., Elgin, Ill.	1894
CARPENTER, GEORGE I., 129 Dean St., Brooklyn, N. Y.	1907
CARRIGER, H. W., 5185 Trask St., Fruitvale Station, Oakland, Cal.	1913
CARTER, JOHN D., Lansdowne, Pa.	1907
CASH, HARRY A., 448 Hope St., Providence, R. I.	1898
CHAMBERLAIN, CHAUNCY W., 36 Lincoln St., Boston, Mass.	1885
CHAPIN, PROF. ANGIE CLARA, 25 Freeman Cottage, Wellesley College, Wellesley, Mass.	1896
CHAPIN, JAMES P., Amer. Mus. of Natural History, New York City	1906
CHAPMAN, MRS. F. M., Englewood, N. J.	1908
CHAPMAN, ROY, 2316 Pierce Ave., St. Anthony Park, St. Paul, Minn.	1911
CHASE, SIDNEY, Nantucket, Mass.	1904

CHEESMAN, MORTON R., 55 W. 4th St., S., Salt Lake City, Utah.....	1911
CHIPMAN, Miss GRACE E., Sandwich, Mass.....	1912
CHRISTY, BAYARD H., 403 Frederick Ave., Sewickley, Pa.....	1901
CLARK, CLARENCE H., Lubec, Me.....	1913
CLARK, JOSIAH H., 238 Broadway, Paterson, N. J.....	1895
CLARKE, CHARLES E., 11 Chetwynd Road, Tufts College, Mass.....	1907
CLARKE, Miss HARRIET E., 9 Chestnut St., Worcester, Mass.....	1896
CLEAVES, HOWARD H., Public Museum, New Brighton, N. Y.....	1907
CLEVELAND, Dr. CLEMENT, 925 Park Ave., New York City.....	1903
CLEVELAND, Miss LILIAN, Woods Edge Road, West Medford, Mass.....	1906
COALE, HENRY K., Highland Park, Ill.....	1883
COBB, Miss ANNA E., 322 Broadway, Providence, R. I.....	1913
COBB, Miss ANNIE W., 20 Amsden St., Arlington, Mass.....	1909
COBB, Dr. STANLEY, 206 E. Chase St., Baltimore, Md.....	1909
COFFIN, Mrs. PERCIVAL B., 3232 Groveland Ave., Chicago, Ill.....	1905
COLBURN, ALBERT E., 806 S. Broadway, Los Angeles, Cal.....	1891
COLE, Dr. LEON J., College of Agric., Univ. of Wis., Madison, Wis.....	1908
COMMONS, Mrs. F. W., 608 Chamber of Commerce, Minneapolis, Minn.....	1902
CONN, HUGH, Cochrane, Ont., Canada.....	1915
CONEY, Mrs. GEO. H., R. F. D., Box 25, Windsor, Conn.....	1906
CONKLIN, CHARLES EDGAR, Roslyn, N. Y.....	1915
COOK, FREDERICK W., 1604 East Harrison St., Seattle, Wash.....	1915
COOK, Miss LILIAN GILLETTE, 165 West 82 St., New York, N. Y.....	1899
COOKE, Miss MAY THACHER, 1450 Fairmount St., Washington, D. C.....	1915
COPE, FRANCIS R., Jr., Dimock, Pa.....	1892
COPELAND, MANTON, 88 Federal St., Brunswick, Me.....	1900
CRAIG, WALLACE, Orono, Me.....	1912
CRAM, R. J., 26 Hancock Ave., W., Detroit, Mich.....	1893
CRANDALL, C. W., 10 Third St., Woodside, N. Y.....	1891
CRANE, Miss CLARA L., Dalton, Mass.....	1904
CRANE, Mrs. ZENAS, Dalton, Mass.....	1904
CREHORE, FREDERIC M., P. O. Box 1252, Boston, Mass.....	1913
CRESSY, Mrs. A. S., Avon Road, Unionville, Conn.....	1912
CROSBY, MAUNSELL S., Rhinebeck, N. Y.....	1904
CULVER, DELOS E., Addingham, Pa.....	1913
CUMMINGS, Miss EMMA G., 16 Kennard Road, Brookline, Mass.....	1903
CURRIE, ROLLA P., 632 Keefer Place N. W., Washington, D. C.....	1895
CURRIER, EDMONDE SAMUEL, 416 E. Chicago St., St. Johns, Ore.....	1894
CURTIS, CHARLES P., 244 Beacon St., Boston, Mass.....	1915
CUSHMAN, Miss ALICE, 919 Pine St., Philadelphia, Pa.....	1910
DANA, Miss ADA, 488 Centre St., Newton, Mass.....	1912
DANE, Mrs. ERNEST B., Chestnut Hill, Mass.....	1912
DAVENPORT, Mrs. ELIZABETH B., Lindenhurst, Brattleboro, Vt.....	1898
DAVIDSON, Mrs. FRANCIS S., 1302 W., S. Grand Ave., Springfield, Ill.....	1912
DAVIS, CHARLES H., 700 N. Hamilton St., Saginaw, W. S., Mich.....	1906
DAY, CHESTER SESSIONS, 15 Chilton Road, West Roxbury, Mass.....	1897

DEAN, R. H., 720 Quintard Ave., Anniston, Ala.....	1913
DEANE, GEORGE CLEMENT, 80 Sparks St., Cambridge, Mass.....	1899
DELOACH, R. J. H., Georgia Experiment Station, Experiment, Ga....	1910
DENSMORE, Miss MABEL, 629 4th St., Red Wing, Minn.....	1910
DERBY, RICHARD, 116 E. 79th St., New York City.....	1898
DEWEY, Dr. CHARLES A., 78 Plymouth Ave., Rochester, N. Y.....	1900
DEXTER, LEWIS, 1889 Elm St., Manchester, N. H.....	1915
DICKEY, DONALD R., San Rafael Heights, Pasadena, Cal.....	1907
DICKEY, SAMUEL S., Waynesburg, Pa.....	1905
DILLE, FREDERICK M., 2927 W. 28th Ave., Denver, Colo.....	1892
DIONNE, C. E., Laval University, Quebec, Canada.....	1893
DIXON, FREDERICK J., 111 Elm Ave., Hackensack, N. J.....	1891
DODSON, JOSEPH H., Room 1201, 19 S. La Salle St., Chicago, Ill....	1909
DORN, Prof. LOUIS, Concordia College, Fort Wayne, Ind.....	1912
DRUMMOND, Miss MARY, 510 Spring Lane, Lake Forest, Ill.....	1904
DULL, Mrs. A. P. L., 211 N. Front St., Harrisburg, Pa.....	1900
DUNLOP, ERIC B., St. Regis Hotel, Winnipeg, Man.....	1915
DURFEE, OWEN, Box 125, Fall River, Mass.....	1887
DURYEA, Miss ANNIE B., 62 Washington St., Newark, N. J.....	1911
DYKE, ARTHUR CURTIS, 205 Summer St., Bridgewater, Mass.....	1902
EATON, Miss MARY S., Monument St., Concord, Mass.....	1909
EATON, SCOTT HARRISON, Malcolm Hotel, Lawrenceville, Ill.....	1912
EDSON, JOHN M., Marietta Road, Bellingham, Wash.....	1886
EHINGER, Dr. CLYDE E., 100 Rosedale Ave., West Chester, Pa.....	1904
EIFRIG, Prof. C. W. GUSTAVE, 504 Monroe Ave., Oak Park, Ill.....	1901
EIMBECK, Dr. A. F., New Haven, Mo.....	1906
EKBLAW, WALTER ELMER, care of G. Ekblaw, Rantoul, Ill.....	1911
ELDRIDGE, ARTHUR S., South Lincoln, Mass.....	1912
ELLIOT, Mrs. J. W., 124 Beacon St., Boston, Mass.....	1912
ELLS, GEORGE P., Norwalk, Conn.....	1904
EMMONS, RUPERT A., 17 T. St., N. E., Washington, D. C.....	1914
EMORY, Mrs. MARY DILLE, 156 Foundry St., Morgantown, W. Va....	1899
EUETE, RUSSELL, Terracé Park, Ohio.....	1915
EVANS, WILLIAM B., Westtown, Pa.....	1897
FARLEY, JOHN A., 52 Cedar St., Malden, Mass.....	1904
FAY, S. PRESCOTT, 53 State St., Boston, Mass.....	1907
FELGER, ALVA HOWARD, North Side High School, Denver, Colo....	1898
FELL, Miss EMMA TREGO, 1534 N. Broad St., Philadelphia, Pa.....	1903
FINDLAY, D. DOUGLAS, Carleton Place, Ontario, Canada.....	1914
FISHER, Miss ELIZABETH WILSON, 2222 Spruce St., Philadelphia, Pa....	1896
FISHER, Dr. G. CLYDE, American Mus. Nat. Hist., New York City....	1908
FLANAGAN, JOHN H., 89 Power St., Providence, R. I.....	1898
FLETCHER, Mrs. MARY E., Proctorsville, Vt.....	1898
FOOTE, Miss F. HUBERTA, 90 Locust Hill Ave., Yonkers, N. Y.....	1897
FORBES, ALEXANDER, Milton, Mass.....	1912
FORDYCE, GEO. L., 40 Lincoln Ave., Youngstown, Ohio.....	1901
FOWLER, FREDERICK HALL, 221 Kingsley Ave., Palo Alto, Cal.....	1892

FOWLER, HENRY W., Acad. Nat. Sciences, Philadelphia, Pa.	1892
FOX, Dr. WILLIAM H., 1826 Jefferson Place, Washington, D. C.	1883
FRANCIS, NATHANIEL A., 35 Davis Ave., Brookline, Mass.	1913
FRASER, DONALD, Johnstown, N. Y.	1902
FREEMAN, Miss HARRIET E., 37 Union Park, Boston, Mass.	1903
FRENCH, CHARLES H., Canton, Mass.	1904
FRENCH, Mrs. CHAS. H., Canton, Mass.	1908
FULLER, T. OTIS, Needham, Mass.	1904
FULLER, Mrs. T. Otis, Needham, Mass.	1909
GABRIELSON, IRA N., Biological Survey, Washington, D. C.	1912
GARDINER, CHARLES BARNES, 5 Minard Place, Norwalk, Ohio.	1903
GERTKEN, SEVERIN, Prof., St. Johns University, Collegeville, Minn.	1912
GLANINI, CHAS. A., Poland, N. Y.	1911
GILMAN, M. FRENCH, Fort Bidwell, Cal.	1907
GLADDING, Mrs. JOHN R., 30 Stimson Ave., Providence, R. I.	1912
GOLSAN, LEWIS S., Box 97, Prattville, Ala.	1912
GOODRICH, JULIET T., 1210 Astor St., Chicago, Ill.	1904
GORDON, HARRY E., 168 Ashbury St., Rochester, N. Y.	1911
GOULD, JOSEPH E., Arcadia, Fla.	1889
GRAHAM, WM. J., Aledo, Ill.	1909
GRANGER, Miss HELEN, 47 Prentiss St., Cambridge, Mass.	1904
GRANGER, WALTER, Amer. Mus. Nat. Hist., New York City.	1891
GRANT, WM. W., 600 Castle St., Geneva, N. Y.	1910
GRAVES, Mrs. CHARLES B., 4 Mercer St., New London, Conn.	1905
GRISCOM, LUDLOW, 20 Fifth Ave., New York City.	1908
GRONBERGER, S. M., Smithsonian Inst., Washington, D. C.	1909
GROSS, Dr. ALFRED O., 11 Boody St., Brunswick, Me.	1907
GUILD, HENRY R., Fly Club, Cambridge, Mass.	1912
GUTSELL, JAMES S., 301 College Ave., Ithaca, N. Y.	1911
HADLEY, ALDEN H., Monrovia, Indiana.	1906
HAGAR, J. A., 79 Washington Park, Newtonville, Mass.	1914
HALL, FRANK H., Agricultural Experiment Station, Geneva, N. Y.	1910
HALLETT, GEO. H., Jr., 199 Owen Ave., Landsdowne, Pa.	1911
HANKINSON, THOS. LEROY, Charleston, Ill.	1897
HARDON, Mrs. HENRY W., 315 West 71st St., New York City.	1905
HARPER, FRANCIS, 555 First Ave., College Point, N. Y.	1907
HARRINGTON, RALPH M., 1239 Central Y. M. C. A., Brooklyn, N. Y.	1915
HARRIS, HARRY, Kansas City, Mo.	1911
HATHAWAY, HARRY S., Box 1466, Providence, R. I.	1897
HAVEMEYER, H. O., Jr., Mahwah, N. J.	1893
HAZARD, Hon. ROWLAND G., Peace Dale, R. I.	1885
HELME, ARTHUR H., Miller Place, N. Y.	1888
HENDRICKSON, W. F., 276 Hillside Ave., Jamaica, N. Y.	1885
HENNESSEY, FRANK C., 1108 E. Porter St., Albion, Mich.	1914
HERRICK, FRANCIS H., Adelbert College, Cleveland, Ohio.	1913
HERRICK, HAROLD, 25 Liberty St., New York City.	1905

HERRICK, NEWBOLD L., Cedarhurst, N. Y.	1913
HERSEY, F. SEYMOUR, 6 Maple Ave., Taunton, Mass.	1911
HERSEY, L. J., Wray, Colo.	1909
HILL, JAMES HAYNES, Box 485, New London, Conn.	1897
HILL, MRS. THOMAS R., The Montrose, Philadelphia, Pa.	1903
HINCKLEY, ARTHUR T., 548 Fifth St., Niagara Falls, N. Y.	1915
HINCKLEY, GEO. LYMAN, Redwood Library, Newport, R. I.	1912
HINCKLEY, HENRY H., 50 West Hill Ave., Melrose Highlands, Mass.	1912
HINE, Prof. JAMES STEWART, Ohio State Univ., Columbus, Ohio.	1899
HINE, MRS. JANE L., Auburn, Ind.	1890
HIX, GEORGE E., 100 W. 91st St., New York City	1904
HODGE, Prof. CLIFTON FREMONT, Univ. of Ore., Eugene, Oregon	1899
HOLLAND, HAROLD MAY, Box 1851, Los Angeles, Cal.	1910
HOLLAND, Dr. WILLIAM J., Carnegie Museum, Pittsburgh, Pa.	1899
HOLLISTER, WARREN D., McPhee Bldg., Denver, Colo.	1901
HOLMAN, RALPH H., 33 Chestnut St., Stoneham, Mass.	1907
HOLT, ERNEST G., Biological Survey, Washington, D. C.	1911
HONYWILL, ALBERT W., Jr., 50 Farmington Ave., Hartford, Conn.	1907
HORSFALL, ROBERT BRUCE, 1457 E. 18 St., Portland, Ore.	1905
HOWELL, A. BRAZIER, Covina, Cal.	1909
HOWLAND, R. H., 164 Wildwood Ave., Upper Montclair, N. J.	1903
HOYT, WILLIAM H., Box 425, Stamford, Conn.	1907
HUBBARD, MRS. SARA A., 177 Woodruff Ave., Brooklyn, N. Y.	1891
HUBER, WHARTON, Gwynedd Valley, Pa.	1915
HUDSON, MRS. K. W., The Bellevue, Intervale, N. H.	1911
HULL, EDWIN D., 6024 Ellis Ave., Chicago, Ill.	1913
HUNN, JOHN T. SHARPLESS, 1218 Prospect Ave., Plainfield, N. J.	1895
HUSSEY, ROLAND F., 1308 E. Anne St., Ann Arbor, Mich.	1915
HUSHER, MRS. EDWIN H., 1495 West Adams St., Los Angeles, Cal.	1915
INGALLS, CHARLES E., East Templeton, Mass.	1885
INGERSOLL, ALBERT M., 908 F St., San Diego, Cal.	1885
IRVING, JOHN, Glen Cove, N. Y.	1894
ISHAM, C. B., 27 W. 67 St., New York City	1891
IVES, H. DAVID, Southampton, N. Y.	1912
JACKSON, HARTLEY, H. T., Biological Survey, Washington, D. C.	1910
JACKSON, THOMAS H., 304 N. Franklin St., West Chester, Pa.	1888
JAMES, NORMAN, Catonsville, Md.	1913
JARVES, Miss FLORA AMY, Box 151, Kingston Hill, R. I.	1913
JENKS, CHAS. W., Bedford, Mass.	1912
JENNEY, CHARLES F., 100 Gordon Ave., Hyde Park, Mass.	1905
JENNINGS, RICHARD D., 129 Harrison St., East Orange, N. J.	1913
JENSEN, J. K., Westwood, Mass.	1912
JEWETT, STANLEY G., 582 Bidwell Ave., Portland, Oregon	1906
JOHNS, ERWIN WM., 19 West Market St., Iowa City, Iowa	1910
JOHNSON, CHAS. E., 714 16 Ave., S. E., Minneapolis, Minn.	1912
JOHNSON, MRS. GRACE PETTIS, City Library Asso., Springfield, Mass.	1908

JOHNSON, JULIUS M., 77 Herkimer St., Brooklyn, N. Y.....	1913
JOHNSON, WILBUR WALLACE, 144 Harrison St., East Orange, N. J....	1914
JORDAN, A. H. B., Everett, Wash.....	1888
JUMP, MRS. EDWIN R., 97 Oakleigh Road, Newton, Mass.....	1910
JUSTICE, HENRY, 2023 Pine St., Philadelphia, Pa.....	1913
KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario.....	1899
KELLOGG, RALPH T., Silver City, N. M.....	1913
KELSO, DR. JOHN E. H., Braeside, Edgewood, Lower Arrow Lake, B. C.....	1915
KENT, DUANE E., 47 West St., Rutland, Vt.....	1913
KERMODE, FRANCIS, Provincial Museum, Victoria, B. C.....	1904
KEYES, Prof. CHAS. R., Mt. Vernon, Ia.....	1904
*KIDDER, NATHANIEL T., Milton, Mass.....	1906
KIHN, WILFRED L., 755 Eastern Parkway, Brooklyn, N. Y.....	1913
KILGORE, WILLIAM, JR., 4304 Colfax Ave., S., Minneapolis, Minn....	1906
KIRKHAM, MRS. JAMES W., 275 Maple St., Springfield, Mass.....	1904
*KIRKHAM, STANTON D., 152 Howell St., Canandaigua, N. Y.....	1910
KIRKWOOD, FRANK C., Monkton, Md.....	1892
KITTREDGE, JOSEPH, JR., U. S. Forest Service, Missoula, Mont.....	1910
KLOSEMAN, Miss JESSIE E., 9 School St., Dedham, Mass.....	1909
KNAEBEL, ERNEST, 3707 Morrison St., Chevy Chase, D. C.....	1906
KNAPP, MRS. HENRY A., 301 Quincy Ave., Scranton, Pa.....	1907
KNOLHOFF, FERDINAND WILLIAM, 40 E. 42d St., New York City.....	1890
KRETZMAN, Prof. P. E., 1230 St. Anthony Ave., St. Paul, Minn.....	1913
KUSER, ANTHONY R., Bernardsville, N. J.....	1908
KUSER, MRS. ANTHONY R., Bernardsville, N. J.....	1910
KUSER, JOHN DRYDEN, Bernardsville, N. J.....	1910
LA DOW, STANLEY V., 610 W. 116th St., New York City.....	1913
LACEY, HOWARD GEORGE, R. F. D. No. 1, Kerrville, Texas.....	1899
LAMB, CHAS. R., 77 Franklin St., Boston, Mass.....	1912
LANG, HERBERT, Amer. Mus. Nat. Hist., New York City.....	1907
LATIMER, Miss CAROLINE P., 19 Pierrepont St., Brooklyn, N. Y.....	1898
LAURENT, PHILIP, 31 E. Mt. Airy Ave., Mt. Airy, Philadelphia, Pa....	1902
LAW, J. EUGENE, 1834 El Cerrito Place, Hollywood, Cal.....	1907
LAWRENCE, JOHN L., Lawrence, N. Y.....	1915
LENGERKE, JUSTUS VON, 200 5th Ave., New York, N. Y.....	1907
LEVEY, MRS. WILLIAM, Alton Bay, N. H.....	1915
LEWIS, HARRISON F., R. R. 2 Yarmouth, Nova Scotia.....	1912
LEWIS, MRS. HERMAN E., 120 Grove St., Haverhill, Mass.....	1912
LIGON, STOKLEY, Chloride, New Mexico.....	1912
LINCOLN, FREDERICK CHARLES, Colo. Mus. Nat. Hist., Denver, Colo.....	1910
LINGS, GEO. H., Richmond Hill, Cheshire, Eng.....	1913
LITTLE, LUTHER 2d, Sierra Madre, Cal.....	1913
LONGSTREET, RUBERT J., Stetson University, DeLand, Fla.....	1913
LUCE, MRS. FRANCES P., Vineyard Haven, Mass.....	1912

*Life Associate.

LUM, EDWARD H., Chatham, N. J.	1904
LUND, EDWARD G., 527 Beacon St., Boston, Mass.	1915
MACLAY, MARK W., Jr., 830 Park Ave., New York City	1905
MADDOCK, MISS EMELINE, 6386 Drexel Road, Overbrook, Pa.	1897
MADISON, HAROLD L., Park Museum, Providence, R. I.	1912
MAHER, J. E., 351 Communipaw Ave., Jersey City, N. J.	1902
MAIN, FRANK H., 227 N. 18 St., Philadelphia, Pa.	1913
MAITLAND, ROBERT L., 141 Broadway, New York City	1889
MANN, ELIAS P., Williamstown, Mass.	1912
MAPLES, JAMES C., Port Chester, N. Y.	1913
MARBLE, RICHARD M., Woodstock, Vt.	1907
MARKS, EDWARD SIDNEY, 655 Kearney Ave., Arlington, N. J.	1915
MARRS, MRS. KINGSMILL, 9 Commonwealth Ave., Boston, Mass.	1903
MARSHALL, ELLA M. O., New Salem, Mass.	1912
MARTIN, MISS MARIA ROSS, Box 365, New Brunswick, N. J.	1902
MARX, EDWARD J. F., 207 Burke St., Easton, Pa.	1907
MATTERN, EDWIN S., 1042 Walnut St., Allentown, Pa.	1912
MATTERN, WALTER I., 1042 Walnut St., Allentown, Pa.	1912
MCCLINTOCK, NORMAN, 504 Amberson Ave., Pittsburgh, Pa.	1900
MCCONNELL, THOMAS S., 1813 Huey St., McKeesport, Pa.	1915
MCCOOK, PHILIP J., 571 Park Ave., New York City	1895
MCILHENNY, EDWARD AVERY, Avery Island, La.	1894
McLAIN, ROBERT BAIRD, Room 26, McLain Building, Wheeling, W. Va.	1893
McLANE, JAMES LATIMER, Jr., Garrison P. O., Baltimore, Md.	1915
McLEAN, HON. GEO. P., Simsbury, Conn.	1913
McMAHON, WALT F., 74 Eddy St., West Newton, Mass.	1913
McMILLAN, MRS. GILBERT, Gorham, N. H.	1902
MEAD, MRS. E. M., 303 W. 84th St., New York City	1904
MEANS, CHAS. J., 29 Marlborough St., Boston, Mass.	1912
MEEKER, JESSE C. A., 51 Washington Ave., Danbury, Conn.	1915
MENGEL, G. HENRY, 739 Madison Ave., Reading, Pa.	1913
MERRIAM, CHARLES, Weston, Mass.	1908
MERRIAM, HENRY F., 26 Wyoming Ave., Maplewood, N. J.	1905
MERRILL, ALBERT R., Hamilton, Mass.	1912
MERRILL, D. E., State College, New Mexico	1913
MERRILL, HARRY, 316 State St., Bangor, Maine	1883
MERSHON, W. B., Saginaw, Mich.	1905
METCALF, Z. P., A. & M. College, West Raleigh, N. C.	1913
MEYER, Lieut. G. RALPH, C. D. of Oahu, Honolulu, H. I.	1913
MEYER, MISS HELOISE, Lenox, Mass.	1913
MILLER, MISS BERTHA STUART, Box 2, Palisade, N. J.	1915
MILLER, CHAS. W., Jaffna College, Jaffna, Ceylon	1909
MINER, LEO D., 1836 Vernon St., N. W. Washington, D. C.	1913
MITCHELL, CATHERINE ADAMS, Riverside, Ill.	1911
MITCHELL, DR. WALTON I., 603 Beacon Bldg., Wichita, Kan.	1893

MOORE, HENRY D., Haddonfield, N. J.....	1911
MOORE, WILLIAM G., 257 W. Main St., Haddonfield, N. J.....	1910
MORCOM, G. FREAN, Box 175, Huntington Beach, Cal.....	1886
MORLEY, S. GRISWOLD, 2535 Etna St., Berkeley, Cal.....	1911
MORRISON, ALVA, 53 Middle St., Braintree, Mass.....	1915
MORSE, ELIZA A., 21 Elm St., Worcester, Mass.....	1913
MORSE, HARRY GILMAN, Huron, Ohio.....	1912
MOSHER, FRANKLIN H., 17 Highland Ave., Melrose Highlands, Mass.....	1905
MOUSLEY, WM. HENRY, Hatley, Que., Canada.....	1915
MUNRO, J. A., Okanagan Landing, British Columbia, Canada.....	1913
MUNSON, Prof. WILLIAM H., 208 Winona St., Winona, Minn.....	1915
MURIE, O. J., Sellwood 219 7th Ave., Moorhead, Minn.....	1913
MYERS, Mrs. HARRIET W., 311 N. Ave. 66, Los Angeles, Cal.....	1906
MYERS, Miss LUCY F., Brookside, Poughkeepsie, N. Y.....	1898
NEWELL, Mrs. H. S., 2431 E. 5th St., Duluth, Minn.....	1912
NIMS, Mrs. LUCIUS, 17 Union St., Greenfield, Mass.....	1913
NOKES, Dr. I. D., 820 Marsh-Strong Bldg., Los Angeles, Cal.....	1915
NOLTE, Rev. FELIX, St. Benedict's College, Atchison, Kan.....	1903
NORRIS, J. PARKER, Jr., 2122 Pine St., Philadelphia, Pa.....	1904
NORRIS, ROY C., 725 N. 10th St., Richmond, Ind.....	1904
NOVY, FRANK ORIEL, 721 Forest Ave., Ann Arbor, Mich.....	1909
OGDEN, Dr. HENRY VINING, 141 Wisconsin St., Milwaukee, Wis.....	1897
OHL, H. C., 1457 Jay St., Fresno, Cal.....	1913
OLDYS, HENRY, Silver Springs, Md.....	1896
*OLIVER, Dr. HENRY KEMBLE, 4 Newbury St., Boston, Mass.....	1900
ORDWAY, Miss ELIZABETH I., 20 Myrtle St., Winchester, Mass.....	1913
OSBORN, ARTHUR A., 58 Washington St., Peabody, Mass.....	1912
OTTEMILLER, FREE, 30 N. Pine St., York, Pa.....	1914
OVERTON, Dr. FRANK, Patchogue, N. Y.....	1909
*OWEN, Miss JULIETTE AMELIA, 306 N. 9th St., St. Joseph, Mo.....	1897
PAINE, AUGUSTUS G., Jr., 18 West 49th St., New York City.....	1886
PALMER, S. C., Swarthmore College, Swarthmore, Pa.....	1899
PANGBURN, CLIFFORD H., 1001 Cherry St., Philadelphia, Pa.....	1907
PAUL, LUCIUS H., 19 Aurora St., Rochester, N. Y.....	1908
PEABODY, LLOYD, 645 Delaware Ave., St. Paul, Minn.....	1915
PEABODY, Rev. P. B., Blue Rapids, Kan.....	1903
PECK, MORTON E., 1458 Court St., Salem, Ore.....	1909
PENARD, THOS. E., 16 Norfolk Rd., Arlington, Mass.....	1912
PENFIELD, Miss ANNIE L., 155 Charles St., Boston, Mass.....	1912
PENNINGTON, FRED ALBERT, 5529 Kenwood Ave., Chicago, Ill.....	1910
PEPPER, Dr. WM., 1811 Spruce St., Philadelphia, Pa.....	1911
PERKINS, ARTHUR W., Farmington, Me.....	1915
PERKINS, Dr. GEO. H., Burlington, Vt.....	1912
PERRY, Dr. HENRY JOSEPH, 636 Beacon St., Boston, Mass.....	1909
PETERS, ALBERT S., Lake Wilson, Minn.....	1908

*Life Associate.

PETERS, JAMES LEE, Harvard, Mass.....	1904
PHELPS, FRANK M., 212 E. 4th St., Elyria, Ohio.....	1912
PHELPS, MRS. J. W., Box 36, Northfield, Mass.....	1899
PHILIPP, PHILIP B., 220 Broadway, New York City.....	1907
PHILLIPS, ALEXANDER H., 54 Hodge Road, Princeton, N. J.....	1891
PHILLIPS, CHAS. LINCOLN, 5 West Weir St., Taunton, Mass.....	1912
PINCHOT, GIFFORD, 1617 Rhode Island Ave., Washington, D. C.....	1910
PLATT, MRS. DAN F., Englewood, N. J.....	1913
POE, MISS MARGARETTA, 1204 N. Charles St., Baltimore, Md.....	1899
POND, MISS ELLEN J., 160 Lexington Ave., New York City.....	1909
PORTER, REV. E. C., 24 Randolph St., Arlington, Mass.....	1912
PORTER, LOUIS H., Stamford, Conn.....	1893
POTTER, JULIAN K., 563 Bailey St., Camden, N. J.....	1912
PRAEGER, WILLIAM E., 421 Douglas Ave., Kalamazoo, Mich.....	1892
PRICE, JOHN HENRY, Crown W Ranch, Knowlton, Mont.....	1906
PRICE, LIGON, R. F. D. 1, Box 44, Dunmore, W. Va.....	1913
PRIMM, ROY LEE, 1113 W. Dayton St., Madison, Wis.....	1912
PURDY, JAMES B., R. F. D. 4, Plymouth, Mich.....	1893
QUIGGLE, JAMES C., McElhattan, Pa.....	1915
RADETSKY, HARVEY D., 4433 Federal Boulevard, Denver, Colo.....	1915
RAMSDEN, CHAS. T., Box 146, Guantanamo, Cuba.....	1912
REA, PAUL M., Charleston Museum, Charleston, S. C.....	1912
REAGH, DR. ARTHUR LINCOLN, 39 Maple St., West Roxbury, Mass.....	1896
REDFIELD, MISS ELISA W., 29 Everett St., Cambridge, Mass.....	1897
REED, HUGH DANIEL, 108 Brandon Place, Ithaca, N. Y.....	1900
REHN, JAMES A. G., 6033 B Catherine St., Philadelphia, Pa.....	1901
REYNOLDS, THEO. E. W., R. F. D. 2, Box 92, Kent, Wash.....	1912
RHOADS, CHARLES J., National Reserve Bank, Philadelphia, Pa.....	1895
RICE, JAMES HENRY, JR., Summerville, S. C.....	1910
RICE, WARD J., Roachdale, Ind.....	1913
RICHARDS, MISS HARRIET E., 36 Longwood Ave., Brookline, Mass.....	1900
RICHARDSON, WYMAN, 50 Claverly Hall, Cambridge, Mass.....	1912
RIKER, CLARENCE B., 43 Scotland Road, South Orange, N. J.....	1885
RIPLEY, MRS. J. W., 67 Greenleaf St., Malden, Mass.....	1912
ROBBINS, CHARLES A., Onset, Mass.....	1914
ROBERTS, WILLIAM ELY, 5513 Irving St., Philadelphia, Pa.....	1902
ROBERTSON, HOWARD, 157 S. Wilton Drive, Los Angeles, Cal.....	1911
ROBINSON, ANTHONY W., 401 Chestnut St., Philadelphia, Pa.....	1903
ROE, CHAS. M., 3012 Bathgate St., Cincinnati, O.....	1906
*ROGERS, CHARLES H., Amer. Mus. Nat. Hist., New York City.....	1904
ROOSEVELT, FRANKLIN DELANO, Hyde Park, N. Y.....	1896
ROPER, KENYON, 509 N. 4th St., Steubenville, Ohio.....	1911
ROSS, GEORGE H., 23 West St., Rutland, Vt.....	1904
ROSS, DR. LUCRETIVS H., 507 Main St., Bennington, Vt.....	1912
ROWLEY, JOHN, 42 Plaza Drive, Berkeley, Cal.....	1889

*Life Associate.

SACKETT, CLARENCE, Rye, N. Y.....	1910
SANBORN, COLIN C., P. O. Box 50, Evanston, Ill.....	1911
SAUNDERS, ARETAS A., Y. M. C. A. Building, New Haven, Conn.....	1907
SAVAGE, JAMES, 1097 Ellicott Sq., Buffalo, N. Y.....	1895
SAVAGE, WALTER GILES, Glenwood, Ark.....	1898
SAWYER, EDMUND J., Box 123, Watertown, Mass.....	1915
SCHENCK, FREDERIC, LENOX, Mass.....	1912
SCHERMERHORN, CHARLES F., Oak Knoll, Fla.....	1915
SCHORGER, A. W., Forest Products Laboratory, Madison, Wis.....	1913
SHANNON, WM. PURDY, 1170 Broadway, New York City.....	1908
SHARPLES, ROBERT P., West Chester, Pa.....	1907
SHAW, CHAS. F., 676 Bedford St., North Abington, Mass.....	1912
SHAW, WILLIAM T., 600 Linden Ave., Pullman, Wash.....	1908
SHEARER, DR. AMON R., Mont Belvieu, Tex.....	1905
SHELDON, CHARLES, Woodstock, Vt.....	1911
SHELTON, ALFRED, Univ. of Ore., Eugene, Ore.....	1911
SHOEMAKER, CLARENCE R., 3116 P St., Washington, D. C.....	1910
SHOFFNER, CHARLES P., 28 German-American Bldg., Phila., Pa.....	1915
SHROSBREE, GEORGE, Public Museum, Milwaukee, Wis.....	1899
SILLIMAN, O. P., 220 Salinas St., Salinas, Cal.....	1915
SIMMONS, GEO. FINLAY, 622 First National Bank, Houston, Texas.....	1910
SMITH, AUSTIN PAUL, 742 Pennsylvania Ave., San Antonio, Texas.....	1911
SMITH, REV. FRANCIS CURTIS, 812 Columbia St., Utica, N. Y.....	1903
SMITH, PROF. FRANK, 913 West California Ave., Urbana, Ill.....	1909
SMITH, HORACE G., State Museum, State House, Denver, Colo.....	1888
SMITH, DR. HUGH M., 1209 M St. N. W., Washington, D. C.....	1886
SMITH, LOUIS IRVIN, JR., 3908 Chestnut St., Philadelphia, Pa.....	1901
SMITH, NAPIER, 46 Côtés des Neiges Road, Montreal, Quebec.....	1915
SMYTH, PROF. ELLISON A., JR., Polytechnic Inst., Blacksburg, Va.....	1892
SNYDER, WILL EDWIN, 309 De Clark St., Beaver Dam, Wis.....	1895
SPELMAN, HENRY M., 48 Brewster St., Cambridge, Mass.....	1911
SQUIER, THEO. L., 149 Fremont St., Battle Creek, Mich.....	1915
STANTON, PROF. J. Y., 410 Main St., Lewiston, Me.....	1883
STANWOOD, MISS CORDELIA JOHNSON, Ellsworth, Me.....	1909
STEPHENS, T. C., Morningside College, Sioux City, Iowa.....	1909
STEVENS, FRANK E., 25 Hudson St., Somerville, Mass.....	1912
STEVENS, DR. J. F., Box 546, Lincoln, Neb.....	1908
STEWART, PHILLIP B., 1228 Wood Ave., Colorado Springs, Colo.....	1915
STEWART, MRS. PHILLIP B., 1228 Wood Ave., Colorado Springs, Colo.....	1915
STILES, EDGAR C., 345 Main St., West Haven, Conn.....	1907
ST. JOHN, EDWARD PORTER, 57 Farmington Ave., Hartford, Conn.....	1911
STOCKBRIDGE, CHAS. A., Fort Wayne, Ind.....	1911
STODDARD, HERBERT LEE, Field Museum Nat. Hist., Chicago, Ill.....	1912
STONE, CLARENCE F., Branchport, N. Y.....	1903
STREET, J. FLETCHER, Beverly, N. J.....	1908
STUART, FRANK A., Marshall, Mich.....	1915
STUART, GEO. H., 3rd, 923 Clinton St., Philadelphia, Pa.....	1913

STURGIS, S. WARREN, Groton, Mass.	1910
STURTEVANT, EDWARD, St. George's School, Newport, R. I.	1896
SUGDEN, ARTHUR W., 52 Highland St., Hartford, Conn.	1913
SURFACE, HARVEY ADAM, State Zoölogist, Harrisburg, Pa.	1897
SWAIN, JOHN MERTON, Box 528, Farmington, Me.	1899
SWENK, MYRON H., 3028 Starr Street, Lincoln, Neb.	1904
TAYLOR, ALEXANDER R., 1410 Washington St., Columbia, S. C.	1907
TEACHENOR, DIX, 3230 Woodland Ave., Kansas City, Mo.	1915
TERRILL, LEWIS McI., 53 Stanley Ave., St. Lambert, Quebec.	1907
THOMAS, Miss EMILY HINDS, Bryn Mawr.	1901
TINKER, ALMERIN D., 631 S. 12th St., Ann Arbor, Mich.	1907
TOWER, Mrs. KATE DENIG, 9 Newbury St., Boston, Mass.	1908
TOWNSHEND, HENRY HOTCHKISS, 69 Church St., New Haven, Conn.	1915
TREGANZA, A. O., 614 E. South St., Salt Lake City, Utah.	1906
TROTTER, WILLIAM HENRY, 36 N. Front St., Philadelphia, Pa.	1899
TUDBURY, WARREN C., 621 Citizens' Nat. Bank Bldg., Los Angeles, Cal.	1903
TUFTS, Miss MARY I., 1 Atlantic St., Lynn, Mass.	1910
TWEEDY, EDGAR, 404 Main St., Danbury, Conn.	1902
TYLER, JOHN G., 1114 Belmont Ave., Fresno, Cal.	1912
TYLER, Dr. WINSOR M., 522 Massachusetts Ave., Lexington, Mass.	1912
VALENTINE, Miss ANNA J., Bellefonte, Pa.	1905
VAN CORTLANDT, Miss ANNE S., Croton-on-Hudson, N. Y.	1885
VAN NAME, WILLARD GIBBS, 121 High St., New Haven, Conn.	1900
VANTASSELL, F. L., 116 High St., Passaic, N. J.	1907
VETTER, Dr. CHARLES, 2 West 88th St., New York City.	1898
VIETOR, Dr. EDWARD W., 166 St. James Place, Brooklyn, N. Y.	1911
VIETOR, Mrs. EDWARD W., 166 St. James Place, Brooklyn, N. Y.	1914
VISHER, Dr. STEPHEN S., 1018 S. 7th Ave., Moorhead, Minn.	1904
WADSWORTH, CLARENCE S., 37 Washington St., Middletown, Conn.	1906
WAITE, Mrs. J. GILMAN, 19 Pearl St., Medford, Mass.	1912
WALKER, Dr. R. L., 355 Main Ave., Carnegie, Pa.	1888
WALLACE, CHAS. R., 69 Columbus Ave. Delaware, Ohio.	1913
WALLACE, JAMES S., 12 Wellington St., E., Toronto, Ontario.	1907
WALTER, Dr. HERBERT E., 67 Oriole Ave., Providence, R. I.	1901
WALTERS, FRANK, 40 West Ave., Great Barrington, Mass.	1902
WARD, FRANK H., 18 Grove Place, Rochester, N. Y.	1908
WARD, Mrs. MARTHA E., 25 Arlington St., Lynn, Mass.	1909
WARD, ROY A., Biological Survey, Washington, D. C.	1915
WARNER, EDWARD P., Concord, Mass.	1910
WATSON, Mrs. ALEX M., 124 Hatton St., Portsmouth, Va.	1910
WEBER, J. A., Palisades Park, N. J.	1907
WELLMAN, GORDON B., 54 Beltran St., Malden, Mass.	1908
WETMORE, Mrs. EDMUND, 125 E. 57th St., New York City.	1902
WEYGANDT, Dr. CORNELIUS, Wissahickon Ave., Mt. Airy, Philadel- phia, Pa.	1907

WHARTON, WILLIAM P., Groton, Mass.....	1907
WHITE, FRANCIS BEACH, St. Paul's School, Concord, N. H.....	1891
WHITE, GEORGE R., Dead Letter Office, Ottawa, Ontario.....	1903
WHITE, Dr. JAMES C., 259 Marlborough St., Boston, Mass.....	1913
WHITE, W. A., 158 Columbia Heights, Brooklyn, N. Y.....	1902
WILBUR, ADDISON P., 60 Gibson St., Canandaigua, N. Y.....	1895
WILCOX, T. FERDINAND, 118 E. 54th St., New York City.....	1895
WILLARD, BERTEL G., 1619 Massachusetts Ave., Cambridge, Mass....	1906
WILLARD, FRANK C., Tombstone, Arizona.....	1909
WILLCOX, Prof. M. A., 63 Oakwood Road, Newtonville, Mass.....	1913
WILLIAMS, Miss BELLE, Sec., Audubon Soc., Columbia, S. C.....	1915
WILLIAMS, ROBERT S., New York Botanical Gardens, New York City..	1888
WILLIAMS, ROBERT W., Tallahassee, Fla.....	1900
WILLIAMSON, E. B., Bluffton, Ind.....	1900
WILLIS, Miss CLARA L., 1615 Beacon St., Waban, Mass.....	1915
WILLISTON, Mrs. SAMUEL, 577 Belmont St., Belmont, Mass.....	1911
WINDLE, FRANCIS, West Chester, Pa.....	1909
WING, DEWITT C., 5401 Dorchester Ave., Chicago, Ill.....	1913
WINSLOW, ARTHUR M., Jackson, Mich.....	1912
WOOD, J. CLAIRE, 179 17th St., Detroit, Mich.....	1902
WOOD, NELSON R., Smithsonian Institution, Washington, D. C....	1895
WOODRUFF, LEWIS B., 14 E. 68th St., New York City.....	1886
WRIGHT, ALBERT H., 707 E. State St., Ithaca, N. Y.....	1906
WRIGHT, Miss HARRIET H., 1637 Gratiot Ave., Saginaw, W. S., Mich.	1907
WRIGHT, HORACE WINSLOW, 107 Pinckney St., Boston, Mass.....	1902
WRIGHT, SAMUEL, Conshohocken, Pa.....	1895
WYMAN, LUTHER E., 3927 Wisconsin St., Los Angeles, Cal.....	1907
YOUNG, JOHN P., 1510 5th Ave., Youngstown, Ohio.....	1911
ZIMMER, J. T., 42 Holdrege St., Lincoln, Neb.....	1908

DECEASED MEMBERS.

FELLOWS.

	<i>Date of Death</i>
ALDRICH, CHARLES.....	March 8, 1908
BAIRD, SPENCER FULLERTON.....	Aug. 19, 1887
BENDIRE, CHARLES EMIL.....	Feb. 4, 1897
COUES, ELLIOTT.....	Dec. 25, 1899
ELLIOT, DANIEL GIRAUD.....	Dec. 22, 1915
Goss, NATHANIEL STICKNEY.....	March 10, 1891
HOLDER, JOSEPH BASSETT.....	Feb. 28, 1888
JEFFRIES, JOHN AMORY.....	March 26, 1892
McILWRAITH, THOMAS.....	Jan. 31, 1903
MERRILL, JAMES CUSHING.....	Oct. 27, 1902
PURDIE, HENRY AUGUSTUS.....	March 29, 1911
SENNETT, GEORGE BURRITT.....	March 18, 1900
TRUMBULL, GURDON.....	Dec. 28, 1903
WHEATON, JOHN MAYNARD.....	Jan. 28, 1887

RETIRED FELLOWS.

GILL, THEODORE NICHOLAS.....	Sept. 25, 1914
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HONORARY FELLOWS.

BLANFORD, WILLIAM THOMAS.....	June 23, 1905
BARBOZA DU BOCAGE, JOSÉ VICENTE.....	July —, 1908
BERLEPSCH, HANS VON.....	Feb. 27, 1915
BURMEISTER, KARL HERMANN KONRAD.....	May 1, 1891
CABANIS, JEAN LOUIS.....	Feb. 20, 1906
DRESSER, HENRY EELES.....	Nov. 28, 1915
GÄTKE, HEINRICH.....	Jan. 1, 1897
GIGLIOLI, ENRICO HILLYER.....	Dec. 16, 1909
GUNDLACH, JOHANNES CHRISTOPHER.....	March 17, 1896
GURNEY, JOHN HENRY.....	April 20, 1890
HARTLAUB, [KARL JOHANN] GUSTAV.....	Nov. 20, 1900
HUME, ALLAN OCTAVIAN.....	July 31, 1912
HUXLEY, THOMAS HENRY.....	June 29, 1895
KRAUS, FERDINAND.....	Sept. 15, 1890
LAWRENCE, GEORGE NEWBOLD.....	Jan. 17, 1895
MEYER, ADOLF BERNHARD.....	Feb. 5, 1911
MILNE-EDWARDS, ALPHONSE.....	April 21, 1900

Deceased Members.

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NEWTON, ALFRED	June 7, 1907
PARKER, WILLIAM KITCHEN	July 3, 1890
PELZELN, AUGUST VON	Sept. 2, 1891
SALVIN, OSBERT	June 1, 1898
SAUNDERS, HOWARD	Oct. 20, 1907
SCHLEGEL, HERMANN	Jan. 17, 1884
SCLATER, PHILIP LUTLEY	June 27, 1913
SEEBOHM, HENRY	Nov. 26, 1895
SHARPE, RICHARD BOWDLER	Dec. 25, 1909
TACZANOWSKI, LADISLAS [CASIMIROVICH]	Jan. 17, 1890
WALLACE, ALFRED RUSSEL	Nov. 7, 1913

CORRESPONDING FELLOWS.

ALTUM, [C. A. =] BERNARD	Feb. 1, 1900
ANDERSON, JOHN	Aug. 15, 1900
BALDAMUS, AUGUSTE KARL EDUARD	Oct. 30, 1893
BLAKISTON, THOMAS WRIGHT	Oct. 15, 1891
BLASIUS, [PAUL HEINRICH] RUDOLPH	Sept. 21, 1907
BLASIUS, WILHELM AUGUST HEINRICH	May 31, 1912
BOGDANOW, MODEST NIKOLAEVICH	March 16, 1888
BROOKS, WILLIAM EDWIN	Jan. 18, 1899
BRYANT, WALTER [PIERC]E	May 21, 1905
BULLER, WALTER LAWRY	July 19, 1906
COLLETT, ROBERT	Jan. 27, 1913
COOPER, JAMES GRAHAM	July 19, 1902
CORDEAUX, JOHN	Aug. 1, 1899
DAVID, ARMAND	Nov. 10, 1900
DUGÈS, ALFRED	Jan. 7, 1910
FATIO, VICTOR	March 19, 1906
HAAST, JULIUS VON	Aug. 16, 1887
HARGITT, EDWARD	March 19, 1895
HAYEK, GUSTAV EDLER VON	Jan. 9, 1911
HERMAN, OTTO	Dec. 27, 1914
HOLUB, EMIL	Feb. 21, 1902
HOMEYER, EUGEN FERDINAND VON	May 31, 1889
KNUDSEN, VALDEMAR	Jan. 8, 1898
KRUKENBERG, CARL FRIEDRICH WILHELM	Feb. 18, 1889
LAYARD, EDGAR LEOPOLD	Jan. 1, 1900
LEVERKÜHN, PAUL	Dec. 5, 1905
LILFORD, LORD (THOMAS LYTTLETON POWYS)	June 17, 1896
MARSCHALL, AUGUST FRIEDRICH	Oct. 11, 1887
MALMGREN, ANDERS JOHAN	April 12, 1897
MIDDENDORFF, ALEXANDER THEODOROVICH	Jan. 28, 1894

MOSJISOVICS VON MOJSVAR, FELIX GEORG HERMANN AUGUST	Aug. 27, 1897
OATES, EUGENE WILLIAM	Nov. 16, 1911
OUSTALET, [JEAN FRÉDÉRIC] ÉMILE	Oct. 23, 1905
PHILIPPI, RUDOLF AMANDUS	July 23, 1904
PRJEVALSKY, NICOLAS MICHAELOVICH	Nov. 1, 1888
PRENTISS, DANIEL WEBSTER	Nov. 19, 1899
PRYER, HARRY JAMES STOVIN	Feb. 17, 1888
RADDE, GUSTAV FERDINAND RICHARD VON	March 15, 1903
SCHRENCK, LEOPOLD VON	Jan. 20, 1894
SÉLYS-LONGCHAMPS, MICHEL EDMOND DE	Dec. 11, 1900
SEVERTZOW, NICOLAS ALEKSYEVICH	Feb. 8, 1885
SHELLEY, GEORGE ERNEST	Nov. 29, 1910
STEVENSON, HENRY	Aug. 18, 1888
TRISTRAM, HENRY BAKER	March 8, 1906
WHARTON, HENRY THORNTON	Sept. —, 1895
WOODHOUSE, SAMUEL WASHINGTON	Oct. 23, 1904
HERMAN, OTTO	Dec. 27, 1914

MEMBERS.

BAGG, EGBERT	July 12, 1915
BROWN, HERBERT	May 12, 1913
CAMERON, EWEN SOMERLED	May 25, 1915
FANNIN, JOHN	June 20, 1904
HARDY, MANLY	Dec. 9, 1910
JUDD, SYLVESTER DWIGHT	Oct. 22, 1905
KNIGHT, ORA WILLIS	Nov. 11, 1913
PENNOCK, CHARLES JOHN (disappeared)	May 15, 1913
RALPH, WILLIAM LEGRANGE	July 8, 1907
TORREY, BRADFORD	Oct. 7, 1912
WHITMAN, CHARLES OTIS	Dec. 6, 1910

ASSOCIATES.

ADAMS, CHARLES FRANCIS	May 20, 1893
ALLEN, CHARLES SLOVER	Oct. 15, 1893
ANTES, FRANK TALLANT	Feb. 6, 1907
ATKINS, HARMON ALBRO	May 19, 1885
EVERY, WILLIAM CUSHMAN	March 11, 1894
BAILEY, CHARLES E.	—, 1905
BAIRD, LUCY HUNTER	June 19, 1913
BARLOW, CHESTER	Nov. 6, 1902
BAUR, GEORG [HERMANN CARL LUDWIG]	June 25, 1898

BECKHAM, CHARLES WICKLIFFE	June 8, 1888
BERIER, DELAGNEL	Feb. 11, 1916
BILL, CHARLES	April 14, 1897
BIRTWELL, FRANCIS JOSEPH	June 28, 1901
BOARDMAN, GEORGE AUGUSTUS	Jan. 11, 1901
BODINE, DONALDSON	Aug. 26, 1915
BOLLES, FRANK	Jan. 10, 1894
BRACKETT, FOSTER HODGES	Jan. 5, 1900
BRANTLEY, WILLIAM FOREACRE	Sept. 9, 1914
BREESE, WILLIAM LAWRENCE	Dec. 7, 1888
BRENINGER, GEORGE FRANK	Dec. 3, 1905
BRENNAN, CHARLES F.	Mar. 21, 1907
BROKAW, LOUIS WESTEN	Sept. 3, 1897
BROWN, JOHN CLIFFORD	Jan. 16, 1901
BROWNE, FRANCIS CHARLES	Jan. 9, 1900
BROWNSON, WILLIAM HENRY	Sept. 6, 1909
BURKE, WILLIAM BARDWELL	April 15, 1914
BURNETT, LEONARD ELMER	March 16, 1904
BUTLER, [THOMAS] JEFFERSON	Oct. 23, 1913
BUXBAUM, MRS. CLARA E.	March 23, 1914
CAIRNS, JOHN SIMPSON	June 10, 1895
CALL, AUBREY BRENDON	Nov. 20, 1901
CAMPBELL, ROBERT ARGYLL	April —, 1897
CANFIELD, JOSEPH BUCKINGHAM	Feb. 18, 1904
CARLETON, CYRUS	Nov. 15, 1907
CARTER, EDWIN	Feb. 3, 1900
CARTER, ISABEL MONTEITH PADDOCK (MRS. CARTER)	Sept. 15, 1907
CHADBOURNE, ETHEL RICHARDSON (MRS. ARTHUR PATTERSON CHADBOURNE)	Oct. 4, 1908
CHARLES, FRED LEMAR	May 6, 1911
CLARK, JOHN NATHANIEL	Jan. 13, 1903
COE, WILLIAM WELLINGTON	April 26, 1885
COLBURN, WILLIAM WALLACE	Oct. 17, 1899
COLLETT, [COLLETTE] ALONZO MCGEE	Aug. 22, 1902
CONANT, MARTHA WILSON (MRS. THOMAS OAKES CONANT)	Dec. 28, 1907
CORNING, ERASTUS, JR.	April 8, 1893
DAFFIN, WILLIAM H.	April 21, 1902
DAKIN, JOHN ALLEN	Feb. 21, 1900
DAVIS, SUSAN LOUISE (MRS. WALTER ROCKWOOD DAVIS)	Feb. 13, 1913
DAVIS, WALTER ROCKWOOD	April 3, 1907
DEXTER, [SIMON] NEWTON	July 27, 1901
DODGE, JULIAN MONTOMERY	Nov. 23, 1909
DYCHE, LEWIS LINDSAY	Jan. 20, 1915
ELLIOTT, SAMUEL LOWELL	Feb. 11, 1889
FAIRBANKS, FRANKLIN	April 24, 1895
FARWELL, MRS. ELLEN SHELDON DRUMMOND	Aug. 6, 1912

FERRY, JOHN FARWELL	Feb. 11, 1910
FERRY, MARY B.	Mar. 18, 1915
FISHER, WILLIAM HUBBELL	Oct. 6, 1909
FOWLER, JOSHUA LOUNSBURY	July 11, 1899
FULLER, CHARLES ANTHONY	Mar. 16, 1906
GESNER, ABRAHAM HERBERT	April 30, 1895
GOSS, BENJAMIN FRANKLIN	July 6, 1893
HALES, HENRY TEASDEL	Nov. 6, 1913
HATCH, JESSE MAURICE	May 1, 1898
HILL, WILLIAM HENRY	Oct. 14, 1913
HOADLEY, FREDERICK HODGES	Feb. 26, 1895
HOLMES, LARUE KLINGLE	May 10, 1906
HOOPES, JOSIAH	Jan. 16, 1904
HOWE, FLORENCE AURELLA	July 9, 1913
HOWE, LOUISE	Sept. 13, 1912
HOWLAND, JOHN SNOWDEN	Sept. 19, 1885
INGERSOLL, JOSEPH CARLETON	Oct. 1, 1897
JENKS, JOHN WHIPPLE POTTER	Sept. 26, 1894
JESURUN, MORTIMER (disappeared)	Feb. 19, 1905
JEWEL, LINDSEY L.	Sept. 5, 1915
JOY, PIERRE LOUIS	March 22, 1894
KELKER, WILLIAM ANTHONY	Feb. 15, 1908
KNIGHT, WILBER CLINTON	July 28, 1903
KNOX, JOHN COWING	June 10, 1904
KOCH, AUGUST	Feb. 15, 1907
KUMLIEN, LUDWIG	Dec. 4, 1902
KUMLIEN, THURE LUDWIG THEODOR	Aug. 5, 1888
LAKE, LESLIE WALDO	Feb. 7, 1916
LAWRENCE, ROBERT HOE	April 27, 1897
LEE, LESLIE ALEXANDER	May 20, 1908
LEVY, WILLIAM CHARLESWORTH	July 5, 1914
LINDEN, CHARLES	Feb. 3, 1888
LLOYD, ANDREW JAMES	June 14, 1906
LORD WILLIAM R.	1916
MABBETT, GIDEON	Aug. 15, 1890
MAITLAND, ALEXANDER	Oct. 25, 1907
MARBLE, CHARLES CHURCHILL	Sept. 10, 1900
MARCY, OLIVER	March 19, 1899
MARIS, WILLARD LORRAINE	Dec. 11, 1895
MARSDEN, HENRY WARDEN	Feb. 26, 1914
McEWEN, DANIEL CHURCH	Nov. 1, 1909
McKINLAY, JAMES	Nov. 30, 1899
MEAD, GEORGE SMITH	June 18, 1901
MINOT, HENRY DAVIS	Nov. 13, 1890
MORRELL, CLARENCE HENRY	July 15, 1902
NICHOLS, HOWARD GARDNER	June 23, 1896

NIMS, LEE.....	March 12, 1903
NORTHROP, JOHN ISAIAH.....	June 26, 1891
PARK, AUSTIN FORD.....	Sept. 22, 1893
PAULMIER, FREDERICK CLARK.....	March 4, 1906
POMEROY, GRACE V.....	May 14, 1906
POMEROY, HARRY KIRKLAND.....	Jan. 27, 1915
PUTNAM, FREDERIC WARD.....	Aug. 14, 1915
RAGSDALE, GEORGE HENRY.....	March 25, 1895
RAWLE, FRANCIS WILLIAM.....	June 12, 1911
READY, GEORGE HENRY.....	March 20, 1903
REED, CHESTER ALBERT.....	Dec. 16, 1912
RICHARDSON, JENNESS.....	June 24, 1893
ROBINS, JULIA STOCKTON (Mrs. EDWARD ROBINS).....	July 2, 1906
SAND, ISABELLA LOW.....	April 20, 1906
SELOUS, PERCY SHERBORN.....	April 7, 1900
SLATER, JAMES HOWE.....	Feb. 22, 1895
SLEVIN, THOMAS EDWARDS.....	Dec. 23, 1902
SMALL, EDGAR ALBERT.....	April 23, 1884
SMALL, HAROLD WESLEY.....	Mar. 12, 1912
SMITH, CLARENCE ALBERT.....	May 6, 1896
SMITH, RUTH COOK (Mrs. H. A. HAMMOND SMITH).....	Jan. 2, 1912
SNOW, FRANCIS HUNTINGTON.....	Sept. 20, 1908
SOUTHWICK, JAMES MORTIMER.....	June 3, 1904
SPAULDING, FREDERICK BENJAMIN.....	Oct. 22, 1913
STONE, WILLARD HARRISON.....	March 15, 1895
SWEIGER, HELEN BRONSON (Mrs. JACOB L. SWEIGER).....	March 24, 1907
TAYLOR, ALEXANDER O'DRISCOLL.....	April 10, 1910
THOMPSON, MILLETT TAYLOR.....	Aug. 7, 1907
THORNE, PLATT MARVIN.....	March 16, 1897
THORNE, SAMUEL.....	July 4, 1915
THURBER, EUGENE CARLETON.....	Sept. 6, 1896
UPHAM, MARY CORNELIA (Mrs. WILLIAM HENRY UPHAM).....	Nov. 29, 1912
VENNOR, HENRY GEORGE.....	June 8, 1884
WATERS, EDWARD STANLEY.....	Dec. 27, 1902
WELLES, CHARLES SALTER.....	Feb. 24, 1914
WILLARD, SAMUEL WELLS.....	May 24, 1887
WILSON, SIDNEY STEWART.....	Nov. 22, 1911
WISTER, WILLIAM ROTCH.....	Aug. 21, 1911
WOOD, WILLIAM.....	Aug. 9, 1885
WOODRUFF, EDWARD SEYMOUR.....	Jan. 15, 1909
WORTHEN, CHARLES KIMBALL.....	May 27, 1909
YOUNG, CURTIS CLAY.....	July 30, 1902

